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WAR AND MENTAL DISEASES.

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Medical Reserve Corps, U. S. A.

Read before the General Sessions, American Public Health Association, October 19, 1917, Washington, D. C.

AMONG the general problems of public health, the subject of mental hygiene has not received the attention it merits. It is among the more recent developments in preventive medicine, but it is an extremely important one and its importance, I think, is going to be very much emphasized and clarified by the conditions in this war. Now, rather than go into any lengthy discussion of the genesis of mental diseases in the war, I thought possibly it would interest you more and certainly would be very much more within the limits of my powers, to tell, as briefly as possible, the way the medical department of the army is meeting the situation of mental diseases which are brought to light by the war.

Three considerations induced the Surgeon-General to make a very much more elaborate organization—not only in numbers but in plan—for the management of mental conditions during war time than probably has ever been made in any army before. These considerations were the history of past wars, for example, our own civil war, throughout the history of which are scattered epilepsy, all kinds of toxic diseases, and insanity. Possibly the best example in history of the effects of war in the way of mental disease, as a single concrete instance, is to be found in the Russo-Japanese war. That war, as far as I know, provided the first scientific report on the question of warfare methods of handling insanity. From the siege of Port Arthur there developed, simply during that siege, 1,700 insane. I have forgotten the actual number of forces engaged, but the percentage of insane was very high; and, for the first time in the history of psychiatry there was organized a system of management which very much relieved the Russian army and very much alleviated the sufferings of the men whose minds had been affected by this war.

As I suppose everyone knows, the chances of recovery from insanity developed during war time are very much greater than from insanity developed in peace. A favorable hospital rate of recovery among civilians during peace is 20 per cent or 25 per cent. The psychoses developed in war time have a higher recovery rate. I think Dr. White told me that during the Spanish war he had at St. Elizabeth's Hospital a recovery rate of 70 per cent.

The history of past wars makes it imperative for the modern army to have a psychiatric department. The frequency of insanity in military forces may be found in army reports, in the Surgeon-General's reports of our navy or our army or of the medical departments of England and France, and of Germany as long as they were accessible, and you will find just about the same thing in all, namely that the discharge rate in practically all armies, is three men in every thousand every year. That is during peace. Now during war, that rate increases to six per thousand, or ten per thousand, varying with different wars. It increases much more rapidly in expeditionary wars, that is, wars in foreign countries. Among our own soldiers we have had a much higher rate of discharge among soldiers serving in China than soldiers serving in this country, and a very extraordinary rate was developed by the German expeditionary forces in the Boxer campaign, when they attained a rate of 50 per 1,000, which, so far as I know, is the greatest ever known. The ordinary civilian rate in a state like New York is 1 per 1,000, whereas the ordinary rate in the army in peace is 3 per 1,000. Insanity is the most frequent cause of medical discharge from our army—more frequent than tuberculosis.

But the present conflict has made all the above mentioned conditions seem academic. The discharges due to nervous conditions in this war are enormous. The English figures—I do not suppose any are accurate yet, and statistics gotten up from different points of view necessarily vary—but the nervous and mental diseases in the English forces have formed, according to the statistics available to me, one-seventh of all the discharges from the British army, and if wounds are excluded two-fifths of all discharges.

Of course you all know that shell-shock, which is a disabling but recoverable form of nervous disturbance, has been enormously frequent in the expeditionary forces of England and Canada, and that probably is included in these high figures I have given. At the outbreak of the war the nervous casualties absolutely overwhelmed the British and French surgeons. Prior to that time, special physicians had not been prominent in either of the armies, and special hospitals had not been organized for the purpose of caring for nervous diseases. They had to make special efforts in England and all over France, had to build special centers for the special care of these cases, and now today one-fourth of all of the neurologists in England—25 per cent of all the men who are neurologists,—have gone to the colors. With these considerations in mind, namely, the army reports and the results of this present war, the Surgeon-General before the actual outbreak of war foresaw the necessity of creating a special department in the army to take care of this kind of disability.

Now the question might naturally be asked, why was not this department created before? It had practically been created in no army before. I think one of the reasons was that before the advent of preventive medicine as a general sanity measure the armies had had to contend with such terrible and fatal diseases that surgeons had no time to contend with the mental disabilities. I have been reading the history of the Spanish war and the diseases they had to contend with: typhoid fever, malaria and yellow fever must have kept all surgeons very busy. Hurried mobilizations are another cause. One of the speakers in the parliament in Canada said that in certain regiments he knew about, 15 to 19 per cent had been sent in such imperfect condition across the seas, that the sea voyage alone made them incapable of being soldiers, and they returned to Canada without having got to the continent at all. Among the causes which disabled them nervous mental disease ranked high.

Armies have not adopted the specialty of nervous and mental diseases because also it is a young specialty. When Doctor Billings put together, in 1886, a book called "A Century of American Medicine," he treated all subjects, but when he came to the subject of psychiatry he said there was no use to write about that, as there had not been any in this country. And that was true. The growth of the real science of psychiatry in this country has been in recent times and came about through the development of such clinics as the clinic at Ann Arbor, the psychiatric clinic at Boston, the Phipps clinic and the one at Ward's Island.

Another branch of clinics which relates to what I am going to say later in regard to the army, has grown out of those just referred to. It is the type of clinic which has developed methods useful to the army. This is the pure psychiatric clinic such as the one used in the disciplinary barracks of Fort Leavenworth. The purpose of the psychiatric clinic is to determine responsibility of men in relation to crime, and the methods employed at the police laboratory in New York, where it is carried out in the best way are as follows: The men arrested the night before are arranged upon a platform placed under a strong light and stand there for a few moments. Down in the body of the house, among the detectives who are there for the purpose of recognizing criminals, are these special doctors, who look at the arrested men and from considerable experience are able to tell which of these men ought to be subjected to a detailed mental examination. Out of a group of 20 they will pick 4 or 5 for more careful examination. That is the principle we have been pursuing in military camps, surveying organizations superficially and picking out individuals for special examination.

On the basis of the need and on the basis of the discovery of a method, Surgeon-General Gorgas in April and May began to let it be known that he would welcome into the army specialists who would take commissions in the reserve corps with the understanding that their work would be in their own specialty. A great many men volunteered for this service. They probably would not have volunteered if they had been asked to do general surgery or general medicine, but being more or less assured that their work would be in their specialty they came in great numbers. One man came in so eagerly that he got in trouble about it. He was going down to Camp Miles. He had only been told the night before that his services were required, and the next morning he rushed down without any uniform and as he was wandering around the reservation in a lonesome kind of a way he was arrested and carried before the colonel. The colonel said to him "The whole trouble is that you came down here without a uniform."

"Well, what shall I do about that?" said the doctor. "Come down tomorrow in a uniform," replied the colonel.

"Very well, I will do that; in what kind of a uniform shall I come down?"

"Why, any—like mine."

So the next day he came down in a full colonel's uniform. (Laughter.)

At present the number of medical reserve officers that are occupied in the army doing this work is well over 200. They are stationed at camps; some are studying in the special hospitals in Europe; some are studying in the special clinics here, so that they may be better equipped to do the work, being specially trained in military psychiatry.

Almost every branch of the service is being or has now been examined by these specialists, and whenever we hear, —as we only hear in a very indirect kind of way,—that some organization, some division, some regiment, is about to sail that has not been examined, a number of officers are immediately ordered with the idea of examining them quickly before they go, and this, of course, is extremely important in view of the extra high percentage of neurologic conditions in expeditionary forces. Every man that goes abroad and breaks down uses up six tons of bottom for two months, you might say. It is very poor economy to let men go abroad who are going to break down from nervous diseases.

The diseases most frequently encountered, in the order of their importance are: First, the mental deficients. The stupid ones cause the same trouble in the army that the backward and feebleminded children do to the schools. It is not a question at all of education, because a man may be absolutely illiterate and still not be feebleminded at all. Some of the Cape Verde islanders that come over here as immigrants, I have been told by the officers at Boston, go through the Binet test like lightning. Savages are uneducated people, but their intelligence may be perfectly good. What really is the test is how far a man has intelligence for his immediate environment. One of the Alabama regiments at Camp Mills was asked if it could read.

"No."

"Can you write?"

"No."

"Can you shoot?"

"Well, I can generally draw a bead on a squirrel at 100 yards."

That man was entirely illiterate, but still perfectly competent in his immediate environment and as such gave promise of making a good soldier. It is not probable that a man who is mentally defective can make a good soldier.

A group of psychologists under Major Yerke are now making examinations in the various camps with new tests that they have devised. The disadvantage of the old tests for feeblemindedness was that they were so time-consuming. The psychologists examine 50 men in 20 minutes, so they can go through a large camp like Camp Meade with reasonable celerity and finish up the whole camp, examining every man in those groups, in a few weeks.

It is extraordinary how little some of these nervous affections are noticed in times of peace. The mental defective in peace time is the stupid fellow called a boob; but in war, he becomes delinquent or forgets his command or fails to appear. Then if he is at the front, he is shot for cowardice. The English found very soon that they were having so many cases at the front where a man seemed to be a coward with the result that he would be summarily court-martialed and shot, that they had to keep alienists and neurologists at the front for the purpose of determining, in cases of breach of discipline under fire, whether the man was responsible or not; and since they have done that the executions have fallen off very much in number. Epilepsy, another scourge of the army, may occur only as slight attacks during peace, but in war the attacks get worse. We endeavor to eliminate all epileptics.

Then come the prodigal sons, the boys that never did well, never stuck at their jobs. They may be bright in a certain way but have no real basis of character or mind. They will leave whatever they are at, whether it is wife or army; consequently they are very undesirable members of a military organization. All cases such as these are examined with painstaking care, are generally recognized beforehand, and gotten out because they are of absolutely no use in the army.

Next come mental diseases of a type that a person can get along with in civil life. They are not of a type that requires a commitment to an institution or confinement, but they are of a type that, as soon as a man is taken away from his little way of doing things, his queer way of getting over or around obstacles or seeing people as he pleases, and making his adjustments to life. When all that is taken away from him and he has to do like everyone else, that is more than he can stand, and in army conditions, the rigid, inflexible, martial rule is too much for him and over he goes. That is the type of case that also goes over under the strain and excitement of the horrible sights of war, and so that class of cases is absolutely of no use in the army.

Syphilis of the central nervous system is another thing which makes men poor assets as soldiers. Now it must be understood that these are things that are passed and have been passed in preceding examinations; and in preceding army reports, all these people have successfully passed the routine physical examinations. Such people as I describe here, may perfectly well pass the tuberculosis or the other physical and surgical examinations, may look to be perfect physical specimens, and still have these defects which make them more undesirable than any physical defect almost possibly could.

Now I will speak just for a moment about what the numbers are that are eliminated in these preliminary examinations. They vary with the type of the organization. They are examined at the recruit depots, of which there are six permanent ones in this country. A recruit depot is the place where the volunteer, after having been examined rather cursorily, goes for his final enlistment. When he comes to the recruit depot he is not a member of the military force of the United States, and is reëxamined at the recruit depot. If it is found there at once that he is physically or mentally incapable, it is a great saving to the country, because then the country is under no obligation. If he is accepted there, and if, two or three weeks later, he breaks down, he may become a financial obligation to the country.

The volunteers coming to the recruit depots have a high percentage—3 per cent to 5 per cent of unfit. The national guard and national army have been mobilized for too brief a period to make it possible to say what their percentage would be. We have watched with the greatest care the officers training camp.

Any one who wants to answer the question, "Who is going to win this war?" should go to the officers training camps, because there you see collected a finer lot of young men than I think have ever been gathered together in the world before. It is not a pleasant thing to be always looking out for the evil, but we must get the evil out in order to get the superb army we will have. In those officers training camps, the candidates, to my mind, combine the two great qualities of soldiers. One of these qualities is the ability to obey, as you can see in the drills, in the look of the eye, in the face. Another is the quality of initiative and independence when the time comes to use it. Now the American boy that goes to a training camp has all those qualities, and the question of who will win the war is, without any doubt, to be answered right there. At the same time, even in that fine body of men—and I bring this up largely as a public health question—even in that picked body of men, the finest lot of young men in the world, from 1½ per cent to 2 per cent are nervously unfit for war. I do not mean intellectual defectives, but men who, for some reason, have not a sound nervous system.

Medical officers do not discharge men from the army; they submit their evidence. The commanding officers of the camp may not want to let these men go. They think they need every one of them as soldiers, and they only let them go when the evidence is almost incontestable that this is for the good of the service. That is one of the things we have to reckon with, that even in the best American young men there is a considerable percentage of nervous defects.

Now these are the methods and some of the results the Surgeon-General has instituted for the good of the army, in the way of elimination of nervous diseases. What has he done for the care of the army in that same way? He has built special hospitals and he has created these special officers and he has gotten together a special personnel of enlisted men. Miss Delano of the Red Cross, has sent out for nurses who have had previous experience in nursing of this kind to so signify to her. There is a long list of specially qualified nurses in nervous disease, who, when the time comes, will go to Europe and will be the salvation of many of these young men who get shell-shock and other nervous conditions, and over there I think the therapeutic results of special organization and special doctors and rest houses is going to be a very great salvation to the men who live in that terrible desolation and see those terrible sights and listen to those terrible sounds. I think the suicide rate will be diminished by the existence of special hospitals, small hospitals of that kind, on the other side. The homesickness—you look in every army report and you will see one great cause of mental upset, is homesickness. Whoever wants a picture of homesickness, not connected with war at all, should read, in the last number of the *Metropolitan*, the letters of Richard Harding Davis to his wife. They are the most dramatic description of homesickness. There was a man who had traveled all over the world and was on his way home, yet how he writes of home! And those soldiers over there, God knows when they are going to get home, and a little quiet rest house, with special nurses and special equipment, I think will contribute greatly to the health and strength of the army.

Now we talk so much about the evil of armies and the perils of war and all that, that sometimes we forget that armies do good and that good does come, in a large, sociological sense, from wars. In the first place the statistical knowledge we are going to obtain as to the kind of young men we have in this country from the investigation carried out in the officers training camps, the national army camps, etc., —from what we learn about these we can shape our sociological policies. Then the civil community has a lot to learn from the way the army does things. Show me the city of 45,000 inhabitants that has a hospital like Camp Meade? They have the picked medical men of the country, the latest equipment—I won't say the best, but all necessary equipment. There is a scientific spirit down there, and an interest in each other and in their work that is really extraordinary and very fine. I think their administration is going to teach all of us a good deal. The army has shown us how well it can take care of sickness in wooden buildings, that I hope our own brick piles and stone piles, built at such great expense, will give place to simple structures which can be burned up at the end of five years to meet new conditions; and that the extra money will be spent on the men that are going to manage them. And the army, in this particular branch I am interested, is going to do great good to the civil community because it will send back to the civil community after the war many trained psychiatrists and neurologists.

THE RED CROSS AND THE WAR.

Dr. W. H. Frost,
Director, Red Cross Sanitary Service Bureau, Washington, D. C.

Address before the General Sessions of the American Public Health Association, October 19, 1917, at Washington, D. C.

TO ALL of us I suppose the name of the Red Cross primarily relates to sick and wounded on the battlefield; that is what we think of when we hear the name, that is the original and chief purpose of the organization. The American Red Cross differs from other organizations, in that its charter includes, in addition to this original, primary purpose, other functions including relief to the civilian population in times of disaster and emergency of all kinds, and even authorizing the devising and promotion of means of their prevention, so that, even in peace times the American Red Cross continues as an organization quite actively through its department of civilian relief. This department, in addition to relief in disasters and sudden emergencies, carries on considerable activities in the line of combating disease, the most familiar of those activities being in the annual campaign against tuberculosis by the sale of Christmas seals through which a million dollars or more is raised annually and turned over to the National Association for the Study and Prevention of Tuberculosis.

Another activity of the Red Cross is in its Town and Country Nursing Service which supplies communities throughout the country with nurses, and of course in that way coördinates with the function of civilian relief. The American Red Cross, in expanding its activity to meet war conditions, has devoted some attention to expanding this phase of its work. Most of its expansion has been in the direction of war relief, but already enormous relief work is being done among the civil population of some European countries, and at home preparation is being made for increasing our work among civil units.

First in development is the so-called home service of the Department of Civilian Relief, which is the service for economic care and assistance to the families of soldiers and sailors. This undertakes to provide varied assistance in the upset state in which such families find themselves because of the absence of the heads of the families, and it undertakes not only to give financial assistance, but to help them out in every way. An important part of that service is the education given in child hygiene and hygiene generally. There is just now being established throughout the country 20 institutes for the education of workers in this home service. It will provide several hundred trained workers within a short time, and it is expected that other institutes will be established.

Still another indication of the appreciation of the work to be done in civil communities is the recent action of the Red Cross Bureau of Nursing Service in separately enrolling public health nurses and pledging them as far as possible to continue in work along their own special lines.

Finally, the most recent activity of the Red Cross has been the establishment of a Bureau of Sanitary Service, the purpose of which has been to assist the civil health authorities of the country in meeting the first definite increased responsibility that war conditions threw upon them, that is the responsibility of safeguarding the sanitary conditions around the military cantonments and naval stations. Of course the importance of these civil communities is very obvious, as they form the immediate zone of contact between the military and civil population. These communities are not under Federal control, they are under State and local jurisdiction, the Federal government only coöperating with them through the Public Health Service.

The necessity for establishing immediate and thorough sanitary control in these civil zones is all the more urgent because of the upset equilibrium in the communities themselves. Where we locate a large cantonment of 40,000 troops, say, in the immediate vicinity of a town of 12,000 or 15,000, abnormal conditions at once arise, its population increases rapidly, its industries expand, its hotel and restaurant facilities have to be expanded, its milk supply has to be increased, and in general normal conditions no longer exist. All this tends to increase health hazards and make immediate sanitary control urgent.

Unfortunately no adequate provision had been made for the necessary expansion of public health forces, or for the sudden increase of those activities necessary to control health measures around these districts. This war emergency might properly be undertaken by the State and Federal governments, but it seemed entirely proper that the Red Cross should offer assistance to these authorities as a temporary measure. It does this by furnishing, where needed, a supplementary personnel of skilled assistants and helpers, and in addition supplies funds to provide the full organization needed to carry out effective measures. This personnel is supplied only on request of the State health authorities, and with the recommendation of the Public Health Service, after a preliminary survey, that the assistance is needed. The Red Cross personnel is placed directly under the direction of the administrative health officer of the district, usually an officer of the Public Health Service who has been delegated by the local authorities with power to act as a local health officer. In some instances the Red Cross organization is under the supervision of a State or local health official in charge of the district. This plan avoids introducing another element of authority.

Up to this time we have established groups of auxiliary workers, so-called "Sanitary Units," 20 districts around military cantonments in 14 States. In all of them progress has been most satisfactory. There has been no friction that I know of and I believe the assistance has been appreciated. The personnel so far provided is not large but it is very probable that these activities will be expanded until such time as the Federal and State authorities provide the necessary funds to continue the work. The Federal and State authorities are necessarily limited in their appropriations for public health work but they are giving their attention to the needs of these extra cantonment areas, and all efforts are directed toward coördinating these activities.

I have dwelt upon this particular phase of Red Cross activities a little more at length than on the other phases of health conservation activities, partly because it is new and partly because it illustrates a principle which I think has been developed for the first time in the relations between the Red Cross and the civil health authorities. The Red Cross has assumed the relation of a direct auxiliary to the State and Federal health authorities, a similar relation to that which it occupies in its military relief to the military authorities. The arrangement has been peculiarly happy, I think, in that it has guaranteed to the Red Cross efficient use of the funds and personnel it has given because of their being placed under efficient leadership. It has been agreeable, I believe, to the civil health authorities, because it has avoided any conflict with their authority and has left them wholly in charge of the work. This represents a principle which I think may well be developed further in the present national emergency.

It was very evident from what was said last night that the spirit of this Association is that public health work throughout this country must be increased and intensified during the war as a war measure because of the increased health hazards. The local, State and Federal public health authorities will find themselves confronted with new problems. They have the authority, the knowledge of conditions, the experience, the machinery to carry out necessary preventive measures, but they will necessarily be handicapped for trained personnel because of the demands of the Army and Navy. They will probably find it necessary, therefore, to train an auxiliary personnel, and for this they will have to turn, to some extent, to the many volunteer relief agencies throughout the country.

The Red Cross, as the largest volunteer relief agency, has certain potentialities, very great potentialities, I believe, as an aid in carrying out whatever general national program of health conservation is adopted. It has enormous financial resources, which I think, however, is its least asset. It has the command of the services, as another great asset, of almost everyone in the country who has any leisure to spare or is willing to give his service to the Red Cross. There are thousands of willing workers who want to serve. Some of them know how to serve, some are not highly trained. As a recognized auxiliary to the government, the Red Cross is in a position to connect this willingness to serve with the government's need and its program.

Finally, the Red Cross is a great national organization, an organization that is being proved every day, thereby giving it an enormous potentiality as an educational agency. If we have a message to send out to the country, and we send it out through the Red Cross organization, it goes to every community in the country and to a very earnest set of members in that community.

I think then that we may feel reasonably sure, since the health authorities of the country must expand their work, the Red Cross is going to have to expand its activities in civil relief.

REHABILITATION OF DISEASED AND INJURED SOLDIERS DUE TO THE WAR.

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Washington, D. C.

Delivered before the American Public Health Association, General Session, October 19, 1917, Washington, D. C.

THERE has been rather an unusual plan in reference to this war in that the aftermath has been taken care of, or is being taken care of, even before it has begun. Usually the soldiers who have come back from war disabled and diseased, have been cared for only by the emergency which they themselves have created. The Surgeon-General, however, this time has already anticipated that and has taken very elaborate steps toward the control and caring for these men who, we know, are coming back sometime after our part of the war begins.

It is the object and policy of the Department to consider that these men are taken into the Army and are wards of the Government. The men are taken out of civil life where they are well and wage-earners in normal civil capacities, and in the service which they are giving to the country, they are disabled. Therefore, it is the duty and the privilege of the Department of the Army to care for these men until they are put back into civil life as nearly restored physically and industrially, as possible. This means that they are to be kept under the control and under the guidance of the Army until all of this is accomplished.

To do that, plans have been laid for the early care of these men, almost at the time of the injury. Therefore, for the physical care of these men, special hospitals already have been ordered and are under way, so that these men who are injured shall promptly have the care of those specially trained physicians and surgeons, in order to avoid the disabilities that come and have come always in wars from delay. This means an elaborate preparation for this kind of work overseas, particularly in France, and there are over there now, a large number of men who are under training and who are working with those in the English government, not only helping them out in their work, but at the same time getting the training which can be of use when they are sent over to France to work among our own American boys. When the disabled arrive in this country, there will be special hospitals to be known as Reconstruction Hospitals.

Here the men will be restored to the greatest potential degree of physical efficiency. An important factor in this work will be the supply of a very large number of artificial limbs, and steps are already under way to provide for these in sufficient numbers. It has been found that in England, where it has been more definitely studied by our people, that they are able to restore for service of those who have been sent back for repair, nearly 70 per cent to 80 per cent. When once this has been done for the soldiers, the enthusiasm that is awakened is, as they tell us, very encouraging. One of the most encouraging phases of this war is that they not only want to get back into service but do get back. There are many men over there, supplied with artificial limbs, who have become aviators and many others physically disabled have gone back to the front and have taken part in actual service which is practical for them even with physical handicaps.

The physical repair is not difficult; the important element is bringing many of these men back industrially so that they can return to their civil life and still be wage-earners. This means a new aspect entirely, because with it means the passing of the word "crippled." These men who have been brought back usually have been sent into the community practically as cripples and have not been able to take part in their life again because returned really handicapped.

These men can very easily, as has often been said, be put back into places where they can fill now vacant positions, but they necessarily will be positions far less important and less to their satisfaction to maintain than those they had left. It would not be fair to take a man who had been a good mechanic, earning good wages, and ask him to take the place of a messenger or possibly an elevator man, or as some one suggested, a floorwalker. The opposite idea is exactly the one that is being followed out. That is, when a man comes back, it will be the endeavor to put him into a degree of efficiency higher than previously, so as to be returned to industrial life again to earn at least the same wage or better than before. This will result in putting the man who will be sent to an employer on a purely business basis able to earn his pay. That is the fundamental part of this plan. To do this, associated with all the hospitals, there are to be established and already are being made some form of industrial occupation.

In the larger ones abroad there are so-called industrial workshops, and for this the better term is really "curative" workshops than industrial, because it has been found that these men can be put back into these simpler forms of industrial occupation and that used as the means of bringing them back into their life and into their health. For a simple illustration —an injured man has returned with a stiffened joint that needs a certain amount of activity to get back its strength and mobility. Instead of applying it entirely by therapeutic means, he can be given some kind of a machine that not only develops him physically but at the same time allows him to use that joint a little more each day.

In this way there is accomplished that therapeutic purpose by means of an industrial occupation which is the foundation work of industrial repair. Each one of these hospitals will be equipped with means of teaching these men the different forms of occupations, and associated with that will be facilities for employment bureaus, so that the disabled can obtain occupation in the line which he has taken up to learn. For example, if a man should come into a hospital in this part of the country and he himself lived in a place in the western part or in the south, and it was the object to return these men as nearly as possible to their homes, we must be able to say to that man "if you will learn a certain trade, there is a place waiting for you in your town or near your town." Therefore, it is the intention to ask all of the boards of commerce and the large business men to aid the government in this portion of the work. There is one other element of this that is very important, and perhaps the most important of all. For two or three years, or more, the importance of the re-training and bringing back of men into industrial occupations, of those who are injured, in the ordinary industrial lines, has been very apparent. The value of this military work is going to be permanent, for it is hoped it can be used or adapted to link on with this very large industrial problem which has already begun to loom up as a prominent problem in the horizon. The very shops and the very methods which will be established and can be established should be continued and carried on in the community as an industrial problem, so that, when this war is over, that part will be practically solved. Therefore, at the end of this war, it is hoped that we shall be able to hand over to the civil communities the solution of this very large problem.

It makes this work, then, not only that of meeting a very great emergency now, but it means that there will be a permanent work which will be turned over to the country at large. This is, in a few brief words, the plan which is being made to take care of these men who we know are coming back to us. The details, of course, are very elaborate, and I do not need to mention them here. I think we should bear in mind two conditions: in the first place, we hope to wipe out the idea of having cripples after this war. We are going to give all these men a fair chance to go back into their old life again. Having given part of life and body to the country, we are not going to send them back into the community as dependents, relying upon the compensation given them and the charity and good-will of the community, but as efficient and independent citizens as before. The other point is that we are going to try to solve this problem so that the work will be of lasting benefit for industrial reconstruction.

MORBIDITY REPORTS AND RECORDS OF THE ARMY.

COLONEL WESTON P. CHAMBERLAIN, M. C., U. S. A.

Read before the Annual Meeting of the American Public Health Association, Section of Vital Statistics, Washington, D. C., October 17, 1917.

MEDICO-MILITARY statistics inform us regarding the influence of the military life upon the health of the soldier, and a study of these statistics enables one to appreciate and compare the varying conditions of service and environment in their relation to the well-being of armies. The information is more accurate and more complete than is often the case regarding disease occurring in civil life. Unfortunately, however, a direct comparison cannot usually be made between statistics for soldiers and those for civilian populations, because, in the first instance, the soldiers belong to a selected and physically superior class, and, in the second instance, the soldier lives under restricted and unusual environment, and is frequently subjected to unfavorable conditions which differ in whole or in part from those affecting the civilian. A comparison between the sick rates in the armies of different countries has been greatly facilitated by the adoption in 1894 of an international nomenclature for medico-military statistics. In spite of uniformity in nomenclature, however, it is still impossible to make a legitimate comparison between the rates in the different armies because of the numerous national differences in physical standards, housing, character of service, discharge for disability and method of handling men affected with slight disabilities.

The following are the main points upon which medico-military statistics are based:

1. The annual number of admissions to sick report, reduced to rates per 1,000 of mean strength. For the calendar year 1914 the admission rate was 660.45 in our army. In 1915 it was 726.19.

2. The annual rate of death per 1,000 of mean strength. For the decade 1905–1914 the death-rate was 5.17 in our army for enlisted American troops.

3. The annual rate of discharge for disability per 1,000 of mean strength. For the decade 1905–1914 the discharge rate was 16.81 in our army for enlisted American troops.

4. The annual total losses per 1,000 of mean strength, this being the sum of the deaths and the discharges for disability.

5. The average rate of constant sickness, or the constant non-effective rate. This also is reduced to rates per 1,000 per year, showing the average number constantly sick throughout a year. In the year 1914 the constant non-effective rate in our army was 23.78.

6. The average number of days per year lost by each soldier for sickness. The average number of days lost per man in the calendar year 1914 was 8.77.

A comparison is also frequently made between the losses from wounds and the losses from disease in different countries and campaigns. This was never a fair test of sanitation because the losses from wounds varied so greatly, depending upon the character of the operations, the activity of the attack, and the proportion of troops engaged in actual fighting. As you all know, prior to the present century, the losses from disease almost invariably greatly exceeded the losses from injuries. In the last few years, the reverse has been the case, as a result of the enormous strides made in military sanitation since the days of the Spanish-American and the Boer Wars. At the present time, disease causes only an insignificant part of the total disability and morbidity in active warfare.

The reports of sickness made in our army, on which medico-military statistics are based, may be classified as follows:

1. Daily reports, covering the total number of sick only, made to regimental commanders and to division surgeons.

2. Weekly reports made from regiments and posts to department and division surgeons, where they are consolidated and transmitted to the Surgeon-General of the Army in Washington, D. C. These reports deal not only with the total numbers on sick report, but also divide the incapacitated into injured and sick, and still further subdivide the sick so as to show the numbers of those who are suffering from each of the more prevalent infectious diseases.

3. Monthly sick reports giving the detailed personal record of each case of illness. This report forms the basis of the tabulations made in the annual report of the Surgeon-General of the Army.

4. Occasional reports. These reports are made to the department surgeon and Surgeon-General, on the occurrence of the first recognized case of contagious disease in a military command.

I will now consider in more detail the four reports referred to above:

First, the daily report: At a fixed hour each day, on the blowing of the bugle call known as "sick-call," the sick of the command are conducted to the point where sick-call is held. With stationary commands, sick-call is usually held shortly after breakfast. The names of all men who claim to be ill are entered in the company sick-book, and under charge of a non-commissioned officer they proceed to sick-call. The medical officer in charge of sick-call examines each man and indicates after the name of each whether he is to be put in hospital, excused from duty and treated in his quarters, or treated and returned to duty. At the conclusion of sick-call, a consolidated report, showing the numbers sick in hospital and in quarters, is sent to the headquarters of the division or other command. Similar reports are sent daily to the division surgeon. These reports enable the division surgeon and commanding general of the division to know what proportion of the force is disabled. If the command is moving, sick-call will usually be held soon after completing the day's march. The consolidated report reaching the division surgeon will show him how many must be evacuated to the rear that night, and he will make the necessary arrangements.

The second or weekly report is made by the regimental surgeons to the division surgeons on the blank I am passing around. When the troops are not organized as a division, the surgeon telegraphs his report to the surgeon of the geographical department in which he is located. The division or department surgeon consolidates the reports he receives and telegraphs the consolidated report to the Surgeon-General in Washington. From these reports the Surgeon-General obtains weekly information as to the total number of sick and injured in hospital and in quarters at each important mobilization point, and also he learns the character of the diseases, since the more important causes of disability are specifically mentioned, such as injury, pneumonia, dysentery, malaria, venereal disease, typhoid, paratyphois, measles, meningitis, and scarlet fever. Also the deaths and causes thereof are reported. From these reports the Surgeon-General figures the rate per 1,000 sick in each locality, and has a bird's-eye view of the entire situation. If the amount of sickness at any special point appears to be unduly high a letter is dispatched or an inspector is sent to that station with a view to determining the cause of the outbreak.

The fourth report, the monthly report of sick and wounded, is the important report which forms the official medical record of each individual soldier. From this report is compiled the valuable mass of statistics which is published in the annual report of the Surgeon-General of the Army. Whenever a man is admitted to sick report, two of these register cards are filled out. One remains with the regiment or station or hospital where the man is treated. The other is sent to the Surgeon-General at the end of each calendar month. The cards for the month, together with a tabulated statement regarding the numbers treated, constitute the Sick and Wounded Report.

As you will see, each card has a place for name, rank, company, regiment, length of service, age, race, birthplace, etc. The "number" space contains a serial number, the numbers being in series from one upwards indefinitely for each station, hospital or regiment from which a sick and wounded report is rendered. The place of admission is usually "from command," but may be by transfer from another hospital or from a passing command, etc. The cause of admission is the disease or injury for which the soldier was admitted. The cause of admission, when possible, is given in conformity with the official table of nomenclature published in the Manual for the Medical Department. This table closely follows the nomenclature of Bellevue Hospital and of the Bureau of Census. Next comes a statement as to whether the disability is or is not "in line of duty"—that is, whether it is or is not an incident of the service. This determination is of much importance as on it depends the soldier's right to retired pay or a pension. Great care in this respect must be taken by medical officers if claims are to be adjudicated with equity to both the individual and the government. Under the heading "Disposition" is shown the final disposition of the patient. This is usually return to duty, which is indicated by the simple word "Duty," but it may be that the soldier dies, deserts, is transferred to another hospital, or is discharged from the service for disability or other reasons. On the reverse of the card is space for a statement as to the days the man continues sick, or in military parlance the "days lost."

The sick and wounded cards pass through the division or department surgeon where obvious errors in preparation are detected, and the cards returned for correction if necessary. When corrected the cards go to the office of the Surgeon-General of the Army for classification and are ultimately filed with the Adjutant General of the Army, where they are available for subsequent reference when any question regarding a soldier's sick record comes up. In the office of the Surgeon-General statistical tables are prepared from the cards for publication in the annual report of the Surgeon-General. These tables show the incidence of total sickness and injury, and of each specific disease and injury, in the entire army, arranged as follows:

1. Commissioned officers as contrasted with enlisted men.

2. Races compared, viz., American, Negro, Filipino, and Porto Rican troops. This table affords a very interesting and valuable comparison.

3. Comparison of sickness for each race at home and abroad, as in the Philippines, Panama, Honolulu, Alaska and China. This furnishes a striking comparison for showing the influence of a climate like the Philippines in determining the incidence of certain diseases.

4. A similar comparison is made regarding the incidence of disease in the different geographical departments in the United States proper.

5. Comparison tables show the influence of the arm of the service on morbidity. It is determined from these tables what influence, if any, is exerted by service in each branch, viz., infantry, artillery, cavalry, engineers, medical department, ordnance, etc.

6. Tables are also prepared from the register cards to show the influence of age and length of military service on morbidity. From these tables, it is learned that the rates for illness, death and discharge for disability are always much greater among young soldiers and among recruits than they are among seasoned soldiers and men who have reached maturity.

The last class of reports of sickness to which I referred, are occasional reports. This class pertains mainly to epidemic disease. Paragraph 201, Manual for the Medical Department requires that the surgeon of a command shall at once report to the commanding officer, to the local board of health, to the department surgeon and to the Surgeon-General, the appearance of the first recognized case of typhoid, paratyphoid, smallpox, measles, diphtheria, cerebro-spinal meningitis, or other epidemic disease occurring at or near a military station. Subsequent reports are made as necessary. At present the surgeon of each national guard and national army cantonment is also required to report daily to the Surgeon-General by telegraph the number of new cases of pneumonia and cerebro-spinal meningitis. When recruits or other bodies of troops move from one station to another, the surgeon of the station of departure sends with them a report showing what epidemic diseases, if any, exist at his station.

The daily reports to the division surgeon enable him to determine promptly if disease is unduly prevalent in any part of his division, and if such is the case, he will at once investigate the causes and institute measures for the correction of unsanitary conditions.

The weekly reports to the Surgeon-General of the Army are tabulated, subdivided and charted at once, and the locations of foci of infection are indicated on spot maps. This enables the Surgeon-General to visualize each week the sanitary conditon of the entire army, and of each individual camp, to detect conditions which demand investigation, and to send special sanitary inspectors to such points at once. It also enables him to answer the numberless questions which are constantly coming in from the press and the public as to the truth of scarehead reports regarding the occurrence of epidemics in the camps.

The application of the principles of preventive medicine to military sanitation has wrought marvels during the 19 years that I have been in the military service. I entered the army during the Spanish American War, in 1898. The older members of your association will recall the enormous amount of sickness which occurred among our troops at that time, and among the British soldiers in South Africa shortly after. Contrast with these figures the sanitary successes of the Russians and Japanese in Manchuria, of the forces now contending in Europe and of our own mobilization last year on the Mexican Border. To note one specific comparison. In 1898 the American Army had approximately 22,000 cases of typhoid fever with about 2,100 deaths. Most of this infection took place within the United States. In 1916 we mobilized an equal number of soldiers in camps along the Mexican Border. There were 46 cases of typhoid fever, with one death, this single death being in the case of an officer of the Medical Reserve Corps, who claimed to have had typhoid fever, and consequently did not take the anti-typhoid vaccination. With the successes of the last 20 years as our guide, and with the hearty coöperation of the United States Public Health Service, the local boards of health and the civilian members of the medical profession, the medical department of the army may look forward to our present vast mobilizations with the confident assurance that epidemic disease will not devastate our cantonments and bring desolation to thousands of homes, even before our soldiers have come into contact with the enemy across the seas.

CLASSROOM VENTILATION AND RESPIRATORY DISEASES AMONG SCHOOL CHILDREN.

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Read before the Sociological Section of the American Public Health Association, October 20, 1917, at Washington, D. C.

THE relationship between the health of school children and the methods of ventilation in class-rooms is a matter of sufficient importance to warrant the obtaining of exact statistical data upon which to base our opinions as to the value of either the open air or the mechanical type of ventilation. The value of fresh air in the prevention or in the treatment of certain types of infectious diseases has been recognized for many years. The literature on the subject, however, bears mainly upon the affirmative side of the case or the results of treatment carried on out of doors or in buildings with open window ventilation. There are few, if any, control studies showing the effects upon similar people treated under similar conditions, in closed rooms or in rooms with mechanical types of ventilation.

For many years we have had a controversy between the advocates of these two types of ventilating systems, with particular reference to their use in schoolrooms. In order to obtain definite data upon this point, the Bureau of Child Hygiene of the Department of Health of New York City began in February, 1916, an inquiry into the possible relationship between the prevalence of respiratory diseases among school children and classroom ventilation. This study was made in coöperation with the New York State Commission on Ventilation, which had full control of the selection of classrooms with reference to the type of ventilation to be included, the preparation of forms for recording observations relating to ventilation, the supervision of methods used in obtaining all data concerning ventilation, and the final checking up and analysis of the data on ventilation. The Bureau of Child Hygiene had supervision of all other details of the plan.

There is no intention in this short statement of giving the full analysis of the various points brought out in the study; the purpose is rather to present the conclusions and those specially interested will have an opportunity to review the entire study which will be published within a short time.

This inquiry consisted of two complete studies. Because of the necessity of having closed windows for the proper operation of the mechanical ventilating systems and on account of the usual prevalence of the respiratory diseases during the colder months of the year, it was determined to have the study cover the period from November to April. The first period of observation lasted from February 19, 1916, to April 8, 1916. These dates covered the time between the opening of the second school term and the advent of spring weather. The second study began with the advent of cold weather and covered the period to the end of the first school term—November 4, 1916, to January 27, 1917.

These two periods were selected first, because of the change of the children from the classrooms studied, due to promotion at the end of the term, and, second, so that the same classrooms might be used with an entirely different group of children of the same age. In 1916, eight schools were studied and in 1916–1917 twelve schools were selected. The general type of children under observation included those of Russian, Italian, Irish and American descent, and of a social status that ranged from the well-to-do who live in comfortable homes, in sanitary surroundings, to the extremely poor, shiftless and ignorant type, where the children receive no home supervision or hygienic care.

For the study of 1916 2,541 children were under observation, and for the 1916–1917 study 2,992 children were observed. The children ranged from the 2B to the 6A grades, and eighty-six per cent were from eight to eleven years of age. These children were grouped in fifty-eight classrooms in 1916 and seventy-six classrooms in the study of 1916–1917.

The children covered by these two studies were of the same age, from the same localities and of the same nationalities but an entirely different group was studied each time.

It was decided that three types of ventilation should form the basis of the study: first, *Type A*. These were the so-called cold, open-window classrooms, ventilated by natural means. It was the desire to have the temperature kept at 50 degrees F. This, however, was found to be impossible owing to variations in the weather, and it therefore ranged from 50 to 60 degrees and occasionally higher. *Type B*. These were moderate temperature classrooms, kept between 60 and 70 degrees F., averaging about 68 degrees F. Ventilation was wholly by open windows. Some rooms had gravity exhaust ducts while others did not. Window deflectors were used in only one room in the 1916 study while in the 1916–1917 study window deflectors were installed and used in all rooms. *Type C*. These rooms were of the same moderate temperature as in Type B, that is, averaging 68 degrees F. Ventilation of the classrooms was by the plenum fan system installed in the buildings, the windows in these classrooms being kept closed.

This broad classification of two types of classrooms with open window ventilation and one type with closed windows, ventilated mechanically, was determined upon in order to make the methods more easily controlled and to furnish a usable basis of comparison. No attempt was made to include finer subdivisions based upon minor types of difference in the ventilating systems as it was obvious that the introduction of so many different factors would needlessly complicate the findings and it would be difficult to show their relation to the results.

The field work was under the direct supervision of nine nurses in the 1916 study and fourteen nurses in the 1916–1917 study. Effort was made to have different observers on duty in the different studies so that the results might not be influenced by the personal equation. Each nurse was in charge of the study in a definite number of classrooms. This number varied from three to eight for each nurse. Records were made at each school session of absences from all causes, absences from sickness other than respiratory, absences due to respiratory sickness, respiratory sickness occurring among pupils in attendance at school, temperature of classrooms at each school session, humidity of classrooms at each school session, and sensations of observers at each school session as to temperature, moisture, odor and air motion in the classroom.

At the beginning of each study each pupil under observation was physically examined by a physician. This examination was supplemented by home visits by the nurse to obtain data relative to home and social conditions.

The daily routine of the nurse was as follows: Each classroom was visited in the morning and in the afternoon. First, the absence records of the children of each classroom were taken at 9 a. m. and 1 p. m. The cause of absence was ascertained at a subsequent home visit. If a physician was in attendance, his diagnosis was accepted. If no physician was in attendance, the case was reported to the school physician who visited the home and made the diagnosis. Second, the record of respiratory affections in children attending school in the classrooms under observation was taken at 9 a. m. and 1 p. m. The pupil's explanation as to the cause was asked in each case, and recorded. These reasons were found to have little or no value. Each child was then inspected by the observer (nurse) to determine if any respiratory affection was present and, if so, its nature. The nature of these observations was confirmed by the physicians at frequent intervals and, for part of the study, were made by the physicians in each case. Frequent instructions as to standardizing diagnoses and repeated checking of the observations showed that the diagnoses were accurate and the observations thorough. Third, record of air conditions was made at eleven o'clock each morning and each afternoon at the end of the period of study immediately before aerating the room for the recreation period. All data were recorded under the following items: odor, temperature, moisture, air motion, air vents. The temperature was taken with the dry and wet bulb, with the sling psychrometer in the center of the room, about three to four feet from the floor, and the humidity was computed therefrom by standard methods.

School units, a unit being one school session, were used as the basis for the study and attached hereto are tables XI A and XI B showing the total registration units in each grouping, the total absence units from all causes in each group, the total absence units due to causes other than sickness, the total absence units due to sickness other than respiratory affections, total absence units due to respiratory sickness, and total respiratory sickness among pupils present in school.

There were 197,977 pupil session units in the 1916 study and 317,881 pupil session units in the study of 1916–1917. A study of Tables XI A and XI B shows that there were 506 more pupil session absences due to

TABLE XI A.

THE ACTUAL FIGURES FROM WHICH THE VARIOUS ABSENCE AND SICKNESS RATES AND PERCENTAGES HAVE BEEN TAKEN ARE GIVEN HERE IN PUPIL SESSION UNITS.

1916.

	Entire group	Type A	Type B	Type C
Total registration units	197,977	61,658	71,231	65,088
*Total absence units from all causes	12,381	3,653	4,492	4,236
Total absence units due to causes other than sickness	5,238	1,644	1,908	1,686
Total absence units due to sickness other than respiratory	4,835	1,354	1,856	1,625
Total absence units due to respiratory sickness	2,308	655	728	925
Total respiratory sickness units among pupils present in school	8,804	2,238	1,618	4,948

*There is a discrepancy in the figures showing total absences computed from the sum of the absences from each of the three causes and the total absence determined from the attendance and registration. The total absence units computed in the latter—indirect—manner are 3,669 for Type A, 4,588 for Type B and 4,340 for Type C. The total for the entire group is 12,597. There are thus 216 absences which do not appear in the foregoing calculations.

TABLE XI B.

THE ACTUAL FIGURES FROM WHICH THE VARIOUS ABSENCE AND SICKNESS RATES AND PERCENTAGES HAVE BEEN TAKEN ARE GIVEN HERE IN PUPIL SESSION UNITS.

1916–1917.

	Entire group	Type A	Type B	Type C
Total registration units	317,881	89,067	113,599	115,215
Total absence units from all causes	19,091	4,506	7,318	7,267
Total absence units due to causes other than sickness	8,872	1,972	3,521	3,379
Total absence units due to sickness other than respiratory	6,696	1,732	2,591	2,373
Total absence units due to respiratory sickness	3,523	802	1,206	1,515
Total respiratory sickness units among pupils present in school	23,255	6,667	5,374	11,214

The total absences from each of the three causes, computed from the sum of the absences from each of the three causes, corresponds with the number determined from the attendance and registration.

respiratory sickness in Type C (the mechanically ventilated classrooms at 68 degrees) than in Type B (the open window classrooms at 68 degrees) and 983 more pupil session absences due to respiratory sickness in Type C (the mechanically ventilated classrooms at 68 degrees) than in Type A (the open window classrooms at 50 degrees). Also, there were 7,257 more pupil sessions of respiratory illness occurring in pupils in attendance at school in Type C (the mechanically ventilated classrooms at 68 degrees) than in Type A (the open window classrooms at 50 degrees) and 9,170 more in Type C (the mechanically ventilated class rooms at 68 degrees) than in Type B (the open window classrooms at 68 degrees).

A study of Tables XII A and XII B shows that in absences from school of children who are ill with respiratory diseases, Type C (the mechanically ventilated classrooms at 68 degrees) has the highest percentage in both studies. Types A and B (the open window classrooms) show variation but in both instances are distinctly lower than in Type C. The percentages relative to respiratory sickness among pupils in attendance show wide variation between the same types in both groups and between the different types in each group. In both studies the percentage of children who had respiratory diseases but who were able to attend school is markedly greater in the Type C classrooms, ranging from 76.1 per cent in the 1916 study to 97.3 per cent in the 1916–1917 study. Type A shows the next highest percentage in both groups: 36.3 per cent in 1916 and 74 per cent in 1916–1917. Type B is markedly lower than either of the other two types: 22.7 per cent in 1916 and 47.3 per cent in 1916–1917.

It may be noted that the respiratory illness among pupils in attendance at school has been higher among the children of the Type A (open window classrooms at 50 degrees) than in Type B (open window classrooms at 68 degrees) while both remain lower than in Type C (mechanically ventilated classrooms at 68 degrees). As an explanation of the excess of respiratory sickness in Type A over Type B, attention is called to the factor of temperature of 50 degrees in Type A and 68 degrees in Type B. In this study the children under observation wore only their ordinary clothing, no extra wraps being provided. Both of these types were open window classrooms, the essential difference being in the temperature. It has been found by Miller and Noble, in a study of "The Effects of Exposure to Cold upon Experimental Infection of the Respiratory Tract" that "the weight of experimental evidence, including our own, does not justify the elimination of exposure to cold as a possible, though secondary, factor in the incidence of acute respiratory diseases."

It seems impossible to show any relation between the percentage of absence and the relative humidity and saturation deficit. In one instance, with a percentage of absence of 19, the relative humidity was 33 and the saturation deficit 5.33, while in the next class, with a relative humidity of 33 and a saturation deficit of 5.15, the percentage of absence was only 3.1. In the classes showing a high relative humidity, one with 73 showed only 3.5 per cent of absences while another,

TABLE XII A.

DATA ON CAUSE OF ABSENCE.

1916.

(Figures represent a rate per thousand possible pupil session units of registration.)

	Absence from all causes	Absence due to causes other than sickness	Absence due to sickness other than respiratory	Absence due to respiratory sickness	Respiratory sickness among pupils in attendance
Entire group...........	62.7	26.5	24.4	11.7	44.4
Type A...............	59.2	26.6	21.9	10.6	36.3
Type B...............	63.1	26.8	26.1	10.2	22.7
Type C...............	65.1	25.9	25.0	14.2	76.1

TABLE XII B.

DATA ON CAUSE OF ABSENCE.

1916–1917.

(Figures represent a rate per thousand possible pupil session units of registration.)

	Absence from all causes	Absence due to causes other than sickness	Absence due to sickness other than respiratory	Absence due to respiratory sickness	Respiratory sickness among pupils in attendance
Entire group...........	60.0	27.9	21.1	11.1	73.1
Type A...............	50.5	22.1	19.4	9.0	74.8
Type B...............	64.4	30.9	22.8	10.6	47.3
Type C...............	63.0	29.3	20.6	13.1	97.3

TABLE XVIII A.

ANALYSIS OF EFFECT OF TEMPERATURE UPON RESPIRATORY SICKNESS.

1916.

Fifty-eight rooms, regardless of type, divided into three groups on a basis of temperature—Group 1, twenty coldest rooms; Group 2, next nineteen rooms and Group 3 nineteen warmest rooms.

	Per cent of sessions				Rate per 1,000	
	Average temperature	59 degrees and below	60 degrees–69 degrees	70 degrees and above	Respiratory absence	Respiratory in attendance
Group 1...........	59.1	52	46	2	10.4	42.6
Group 2...........	66.6	4	78	18	8.2	58.0
Group 3...........	69.8	0	40	60	15.8	68.0

with 76, showed 25.5 per cent of absences. Where the relative humidity was low, one class with 21 had an absence percentage of 6.8 while another with a relative humidity of 28 had an absence percentage of 31.0.

Tables XVIII A and XVIII B seem to show a causative relation between temperature and absences from respiratory sickness and number of pupils with respiratory sickness in attendance at school. It will be noted, however, that the average temperature given in Groups 1, 2 and 3 correspond very closely to the types of ventilation and in this view may be regarded as coincident factors, as may be seen in Tables XIX A and XIX B. In considering, however, the two factors—temperature and type of ventilation—the first, temperatures of Groups 2 and 3 have been shown to be closely related, while the second factor—type of ventilation—shows a marked difference, Type B, corresponding to Group 2, being the open window type of ventilation, while Type C, corresponding to Group 3, is the closed window, mechanical type of ventilation. The second factor, therefore, would seem to have had the greatest causative influence.

This investigation among 5,533 pupils in 76 classrooms in 12 schools operated under three different types of ventilation, conducted during a five-months period in the late fall, winter and early spring, forms the basis for the following conclusions:

1. In the closed window, mechanically ventilated type of classroom kept at a temperature of about 68 degrees F. the rate of absences from respiratory diseases was 32 per cent higher than in the open-window, naturally ventilated type of classroom kept at the same temperature (about 68 degrees F.) and about 40 per cent higher than in the open window, naturally ventilated type of classroom kept at a temperature of about 50 degrees F.

It was found, therefore, in this investigation, that children in classrooms with closed windows and ventilated by mechanical methods were more subject to respiratory diseases severe enough to keep them from school attendance than were children who were in classrooms kept at the same or lower temperature and ventilated wholly by open windows.

2. In the closed window, mechanically ventilated type of classroom kept at a temperature of about 68 degrees F. the rate of respiratory diseases occurring among pupils in attendance was 98 per cent higher than in the open window, naturally ventilated type of classroom kept at the same temperature (about 68 degrees F.) and about 70 per cent higher than in the open window, naturally ventilated type of classroom, kept at a temperature of about 50 degrees.

It was found, therefore, in this investigation, that children in classrooms with closed windows and ventilated by mechanical methods were more subject to respiratory diseases not sufficiently severe to keep them from school attendance than were children who were in classrooms kept at the same or lower temperature and ventilated wholly by open windows.

3. It was found in this investigation that the relative humidity of classrooms, whether ventilated by natural or mechanical means, was not a causa-

tive factor in the occurrence of respiratory illness among school children.

4. It was found in this investigation that the occurrence of respiratory diseases among school children was not influenced by sex.

TABLE XVIII B.

ANALYSIS OF EFFECT OF TEMPERATURE UPON RESPIRATORY SICKNESS.

1916–1917.

Seventy-six rooms, regardless of type, divided into three groups on a basis of temperature—group 1, twenty-six coldest rooms; Group 2, next twenty-five rooms and Group 3, twenty-five warmest rooms.

	Per cent of sessions				Rate per 1,000	
	Average temperature	59 degrees and below	60 degrees–69 degrees	70 degrees and above	Respiratory absence	Respiratory in attendance
Group 1	59.6	42	56	2	10.1	69.3
Group 2	66.6	2	97	1	9.3	39.5
Group 3	69.1	0	95	4	15.4	103.7

TABLE XIX A.

TYPE OF VENTILATION.

1916.

	Number of rooms in each type		
	Type A	Type B	Type C
Group 1	17	3	0
Group 2	1	10	8
Group 3	0	8	12

TABLE XIX B.

TYPE OF VENTILATION.

1916–1917.

	Number of rooms in each type		
	Type A	Type B	Type C
Group 1	20	6	0
Group 2	0	14	11
Group 3	0	8	17

INDUSTRIAL HYGIENE IN WAR TIME.

W. Gilman Thompson, M. D.,
New York.

Read before the Massachusetts Association of Boards of Health, Pittsfield, Mass., October 25, 1917.

AMONG the many great lessons of the war the need of thorough study of the industrial diseases is being impressed upon us with constantly increasing emphasis, and we must speed up our researches in this direction if we would keep pace with the "speeding up" of war industries in particular and with industry in general.

It is of especial interest at this conference of the health officers of the State to recall that almost the first authoritative public presentation of the subject in this country was made just a decade ago, when the Massachusetts State Board of Health exhibited in Boston a series of ninety photographs illustrative of occupational disease hazards, embodying the recent studies of that Board. This was followed, in 1910, by the meeting in Chicago, of the first National Conference on Industrial Diseases, which excited so much attention that at the second conference, assembled two years later, the American Medical Association, in a joint meeting of its Section on Hygiene and Public Health with the conference, for the first time, recognized sufficient importance in the subject to devote a session to its consideration. This was indeed a tardy following of the achievements in Europe, where, for many years preceding, great advances had been made by at least nine different nations in both the educational and legislative features of the occupational diseases, based upon comprehensive research and intensive study. There, hygienic institutes and museums abound, under government endowment, with opportunities for the adequate instruction and training of specialists, the like of which we have yet to realize here.

While it is still true that in this country anyone wishing to qualify himself as an expert in the industrial diseases, must largely work out his own salvation, and gather through his individual experience such lessons as he may, it is nevertheless a fact that the researches of the past decade, conducted mainly through the admirable investigations of the health boards of some few states, supplemented here and there by the industrial physicians employed in individual plants, afford a most encouraging beginning in what is rapidly becoming a highly specialized branch of medical science. It is fair to assume, therefore, that within the next decade American industrial medicine may be established upon as broad a foundation and with as ample facilities for instruction and research as long have obtained abroad. It should be a source of congratulation to the members of this Conference that Massachusetts was a pioneer state in gathering data and instituting measures of control of the industrial diseases, having issued important bulletins of investigations since 1904. Naturally those states in which industrial plants are most varied and extensive are foremost in this work, and among them, in addition to this state, those which thus far have put forth the best effort are Illinois, New Jersey, Minnesota, Wisconsin, New York, Connecticut and Pennsylvania.

The extension of the employers' liability acts and of employees' health insurance from covering industrial accidents, to include industrial diseases, will give extraordinary impetus to the study of the latter. It is, however, my firm conviction that in most instances education is preferable to legislative compulsion in securing permanent results in mitigating the hazards of occupational diseases, for it is better to lead than to drive. The employer who is compelled by law to make extensive and expensive alterations in his plant for the betterment of the health of his workmen, too often does it grudgingly or evasively. On the other hand, when he is educated to appreciate the economic advantages which accrue from maintaining his employees in a condition of maximum health efficiency, his willingness to avail of the suggestions intelligently offered is often most gratifying and certain to be permanent. I have heard this matter discussed in a society of Industrial Physicians with conviction of the correctness of this view. While inspecting a large rubber industry in Ohio, one of the most successful in the country, one of its chief executive officers said to me that he regarded his workman as a "machine," a statement which at first thought seems anything but humanitarian. But he went on and stated that when he bought a new mechanical machine he expected it to be delivered in prime working order and thereafter endeavored to maintain it so. When he employed a "human machine," he expected the man to deliver himself in good order and so maintain his health as to enable him to yield a maximum efficiency. To that end the company had instituted initial thorough physical examinations of every employee, and subsequent periodic examinations. The employee was not to apply when debauched by alcohol, syphilis, or otherwise, was to obey the simple rules for avoiding infection of wounds (and there are very many slight cutting wounds in parts of the rubber industry), and he was to report promptly when ill and receive the aid furnished by a large corps of physicians and nurses in the emergency hositals of the plant. This company in its health organization had gone far beyond any legal requirements of the state and was working out a hygienic system which was proving both economic and humanitarian. This, to my thinking, is the true way to deal with the situation, and I confess to feeling somewhat ashamed that the medical profession was so far behind in ability to furnish authoritative standards of industrial hygiene to a company already so far advanced as earnestly to be seeking them. It is herein that state health officers can do a most efficient work, in agreeing upon and formulating standards and presenting them in comprehensive form in a campaign of education.

Lately I have been occupied upon two of the committees of the Advisory Commission of the Council of National Defense. One was to formulate plans for dispensaries for treatment of industrial diseases to be located near groups of large industrial plants. The other was to formulate health standards for munitions workers. With regard to the latter, the question arose as to whether these standards should be incorporated in the government contracts for munitions. After much discussion, the committee agreed that it would be undesirable and impractical to do this universally, lest the necessary haste be hampered. It was therefore agreed to divide the standard hygiene specifications into three major groups, as follows: First, a small group of obviously essential conditions which easily might be established, and, in fact, which already largely are existent, without retarding the industry. Second, a group of desirable standards which should be established within a reasonable time, say a year or two. Third, a group of more or less ideal standards, the advantage of which is pointed out, but which are not suggested as compulsory.

This would seem a rational method of dealing with so complex a subject, for the report includes practically everything from showers and washbasins to soap, from overalls and lockers to forced draft, etc.

Nothing better illustrates the difficulties of inserting in legal formularies, the standards of hygiene, than the munitions industry, for not only have there been introduced within a very few years, entirely new high explosives like trinitrotoluol and lydol, but methods of manufacture constantly are being changed, and legislation which is effective today, may become futile or inadequate tomorrow. Another feature emphasized by this industry is the great importance of the periodic examination of the workmen. Despite the utmost care and most favorable environmental conditions, poisoning will occur sooner or later in some of the workmen, just as explosions will occasionally occur despite every protective device. The group of nitro-aromatics, including such high explosives as trinitrotoluol and trinitro benzol, produces very definite symptoms, which, in common with most industrial chemical poisons, may be either acute or chronic. In the acute cases such symptoms are observed as intense frontal headache, marked anorexia with pains in the lower abdomen and precordium, vertigo, extreme muscular weakness and cyanosis, with sometimes an increase in temperature of two or three degrees. Regarding the latter symptom, Dr. W. G. Hudson suggests the interesting hypothesis that it may be due to liberation of hematin from ruptured erythrocytes, such as occurs in malaria in association with development of the febrile paroxysm. In the chronic type of poisoning the above symptoms may be present, although in less striking degree, but superadded are icterus and biliuria. With the occurrence of cyanosis all the other symptoms become intensified and the case proceeds to fatal termination with morbid changes in the liver resembling acute yellow atrophy. The great value of frequent physical examinations, particularly of blood tests, is strikingly exemplified in cases of this type, and Doctor Hudson, at the works of the Dupont Nemours Company, has instituted such periodic examinations every fortnight, for he found that an increasing lymphocyte count running above 30 per cent., with commencing red cell destruction, give timely warning whereby the workman's life could be saved by changing his occupation to open air work. Owing to the enforcement of this periodic examination fatal cases of trinitrotoluol poisoning, or T.N.T. poisoning as it is termed, have not yet appeared in any of the Dupont works, although numerous fatalities were reported abroad at the outset of the war.

The readiness with which aniline and similar compounds are absorbed through the skin to produce systemic effects is well known and I have met with several cases of this sort in which the symptoms resembled the milder type of T.N.T. poisoning, but without the more characteristic blood picture. Owing to the rapid development of the dyestuff industry in this country we should especially be prepared for the early recognition of such toxemias. Many of the explosives plants which have so rapidly expanded to meet emergency conditions are likely, after the war, to undertake the manufacture of dyes and other chemicals upon a scale never before contemplated in this country and the study of the effects of these poisons becomes an urgent problem, for in the absence of antidotes, prevention must be our reliance, and employers must be forewarned of the hazards likely to be encountered. For many years after the war immigration conditions will continue to be greatly disturbed, and the callous manufacturer can no longer readily pick up new workmen to replace those whose health has been ruined in his industry. The employer must therefore soon learn the absolute economic necessity of exercising reasonable precautions to maintain high health standards. Although willing to adopt them he may be ignorant of the best preventive measures, and hence the urgent need of formulating accepted standards for him. Another type of poisoning has developed in rapid degree through the exigencies of the war: that is poisoning by nitrous fumes in the manufacture of fulminate and other explosives, and also poisoning by all the noxious gases so barbarously employed in trench warfare. Their effects in producing agonizing dyspnoea through acute pulmonary edema are too familiar to need recounting here. The absence of any true antidote and the frequent failure of such remedial measures as inhalation of atomized oils, hypodermatic injection of atropine, counterirritation, venesection and artificial respiration, emphasize anew the importance of preventive measures, through the use of forced drafts, of respirators, protection against explosion of carboys and acid tanks, ample supply of emergency appliances, etc.

Another matter, of much older type than that of the newer chemical poisons is the question of fatigue in industry, which has received renewed attention in reference to the speeding up of work in munitions plants. The whole question of industrial fatigue is at the moment receiving expert study through a sub-committee of the Council of National Defense of which Professor Frederick S. Lee is an active member. Among other investigations in plants in Pennsylvania, the committee is studying the Ford Motor plant in Detroit. In the report of the British Ministry of munitions on "Munition Workers in England and France," industrial fatigue is defined as "the sum of the results of activity which show themselves in a diminished capacity for doing work" and the whole question was exhaustively studied in relation to decreased output, spoiled work, greater frequency of accidents from machinery, sickness and lost time or "staleness." The munitions manufacturers in England at the commencement of the war, were laboring under the delusion that long hours invariably meant high output. Their mistake, however, soon became apparent in the lowered health and reduced efficiency which resulted under their original double shift of 12 hours. It was found that almost invariably there was as much or even greater output from an 8 hour three-shift system. Too much overtime work, moreover, not only retarded work in the overtime period, but the fatigue carried over into the working hours as well. In one group of workers there was a 5 per cent. increase of output in a 10 hour period as compared with the previous 12 hour period. Night work, while not necessarily injurious *per se*, involves such complications as returning home in cold early morning hours when transportation facilities may be poor, meal hours are disarranged, and many persons find it difficult to obtain sufficient sleep in the daytime, particularly if their homes are in a noisy neighborhood. The rapid enormous expansion of munitions plants, moreover, made it necessary to employ thousands of new workmen who had to make long journeys to their work, all the nearby houses being already occupied. The time required in such journeying becomes a very important factor after night work, or when it has to be deducted from a 12 hour shift. In some cases in England this difficulty reduced the workman's available time all told for sleep and family life to 6 hours. Too long a distance to be travelled from home to workshop means early breakfast and a long interval to dinner, during which the fatigue curve rises. Similarly, through not requiring work on Sundays or regular holidays, the output was increased, and such work should not be required except at rare intervals in emergency. The net result of this parliamentary investigation of the British Munitions workers was to recommend the abolition of continuous 7 day labor, the substitution for continuous night work of 8 hour shifts, for heavy work, a maximum of 56 hours a week, and moderately heavy work 60 hours. These are regarded as the best regulations for maximum output on a war time basis. It is recognized, however, that much must depend upon the workman's age, physique and training as well as the nature of the work itself. For example, a group of men employed in the fatiguing process of sizing fuses increased their output 10 per cent. by cutting down their weekly hours from 61.5 to 55.5, *i. e.* by 6 hours. The introduction of brief rest pauses to break 4 or 5 hour stretches of continuous work, also may increase output. All these are problems requiring expert study here, if we are to profit by the errors of inexperience in the early speeding-up stages of the war.

Quite a different subject is the study of the effects of dust inhalation, and although much investigation has been bestowed upon the effects of dust in general, there is a very meagre literature upon the effects of specific dust. In general we know that dusty trades have increased rapidly of late years with the elaboration of manufacture of building materials, textile fabrics, sandblasting processes, emery grinding, many polishing trades, etc. We know also that dusts may act as mechanical irritants by virtue of their sharp insoluble particles; as poisons, by virtue of their chemical composition; as obstructions in the respiratory passages through swelling of their absorbent particles; or finally, as conveyors of disease germs as in the case of the soft dust of feathers, etc. Yet how little is as yet accurately known in regard to the detailed effects of particular kinds of dust. How often one meets with workmen enshrowded in dust, who make no complaint of it, or who seem to have acquired an astonishing and inexplicable toleration for it. While visiting a limekiln with a friend, in a town not many miles from Pittsfield we both began to cough and sneeze, yet the workmen, white with dust from head to foot, declared they were perfectly well. I have had a similar experience in the rag shredding room of a nearby paper mill, yet were these workmen examined carefully, I feel certain they must show evidence of rhinitis, chronic bronchitis, pulmonary fibrosis, or other respiratory disease. When they acquire what they term a "cold" it is not customary to attribute it to their occupation, and if incapacitated from further immediate work, they may in time seek other employment with the ground well harrowed for the seeds of tuberculosis. Some excellent studies of the dusty trades have been made by the Massachusetts State Board of Health, I readily acknowledge, but broadly speaking, the detail of the menace of the dusty trades is one of the least understood and certainly the least widely appreciated of all the industrial disease hazards.

It has been my custom for years in my clinic and hospital service to inquire minutely into the details of employment of each industrial worker, with the result of clearing up many an otherwise obscure diagnosis and explaining many a puzzling etiological factor. It is so simple a thing to do, and yet how few physicians interest themselves in it! These matters are almost entirely neglected in our general medical text-books, and with two or three notable exceptions, such as may be found at Harvard and Cornell, they are not dwelt upon in medical college teaching. Yet trhee is a rapidly growing demand on the part of large industrial plants for employees' physicians who ought to have acquired at least rudimentary training in industrial diseases and the special features of industrial hygiene.

I think we must all agree that comparatively little is to be expected from the workman himself in regard to hygienic matters. The strongest proof of this statement lies in the fact that among the many thousands of strikes in this country not one labor union has yet called a strike specifically for the purpose of remedying bad hygienic conditions in a plant. Strikes have been held for reasons indirectly affecting health, as for shorter hours of labor, but who ever heard of a strike in a felt hat factory because the workmen were acquiring chronic mercury poisoning, or in an explosives plant because the workmen were developing acute yellow atrophy of the liver? Apart from legislative compulsion—which too often is merely legislation with the compulsion feature left out through lack of appropriation for adequate inspection—is the question of reaching the employer in a manner to insure his interest and coöperation. To this end brief statistical statements, clearly printed, of what already has been accomplished by the better class of industrial corporations should be furnished him, he should be invited to attend experience meetings from time to time where health officers and industrial physicians make a point of telling just what conditions they have observed in his and other similar plants, emphasizing the good as well as the bad, and this should be followed by frequent brief bulletins sent to him by the State Department of Health, after the style of the weekly bulletins of the National Safety Council, but dealing with disease hazards in distinction from accidents. I am a great believer in the educational value of museums in teaching industrial hygiene, yet apart from the admirable Museum of Safety in New York (which, by the way, is just beginning to include disease hazards of industry), there is no institution in the country where an employer can go and in a brief time find graphically portrayed, illustrations of all that has been done or should be done for health betterment in his industry. We should have both a national museum of industrial hygiene in Washington, and state museums. This is a large and influential organization, with great opportunities before it. Why not through a committee devise plans for such a museum, have detailed plans drawn out by an architect (and many would gladly make such plans in the rough without immediate cost) and armed with them start a campaign among the state legislators to interest them in making Massachusetts, which is a foremost manufacturing state, a foremost industrial hygiene state as well? Show them pictures of the great foreign museums of hygiene, and point out definitely the gain to the state to be derived through conservation of the health of those who are daily serving it through arduous work. Appeals of this sort are usually far too vague. We introduce bills for "adequate" ventilation in factories, for "sufficient" washing facilities, etc. Let us have a state museum of hygiene where all such appliances can be shown with models, statistical charts and diagrams. There is plenty of material at hand or readily obtainable and the members of this organization could soon furnish all that is necessary to inaugurate the exhibits in the institution. This may be an inopportune time to seek state appropriation, or possibly to induce some wealthy manufacturer to immortalize himself through endowment, but no time is inopportune for education, so why not begin? Is this too utopian a plan?

RATS AND INSECTS AS PUBLIC ENEMIES.

PROF. W. T. SEDGWICK,
Massachusetts Institute of Technology, Cambridge, Mass.

Read before the Massachusetts Association of Boards of Health, Pittsfield, Mass., October 25, 1917.

I AM sorry that we were unable to secure as a speaker at this important meeting Doctor Lumsden of the United States Public Health Service, upon the fundamental subject of rural sanitation. Contrary to the ideas of most people who live in cities, the United States is still a rural community, *i. e.*, a large majority of our people still live under rural conditions and very many of them in remote and lonely farmhouses. Moreover these rural farmhouses and communities are infinitely more nearly bound to our cities than city dwellers are prone to recognize, for it is from them that food supplies flow into the cities and to them that city diseases may flow back. Nowhere is it more true than just here that "we are all members one of another."

I am very glad, however, that we have with us so large a representation of teachers, for I am sure that many of these are in contact more or less close with the rural communities of Berkshire County, and that they are keenly desirous of carrying back to those communities whatever lessons we may have to give.

One of these is the sanitary and economic importance of rats and insects, not only to rural communities and to dwellers upon farms but hardly less to the inhabitants of cities.

I am not going to make more than a very few elementary statements, for every one is tolerably familiar today with the destructiveness of rats and at times hardly less familiar with the ravages of insects such as locusts, grasshoppers, gipsy moths and browntails. All of these are rodents or insects which at times destroy food or annoy us, and some of them occasionally convey disease. For an excellent account of the destructiveness of rats, let me refer you to the *National Geographic Magazine* for July, 1917.

I have just come from Washington and from hearing an eloquent address upon the need of food conservation from that master of the subject, Mr. Hoover, and I have come back desiring to be not only a disciple but if possible an apostle in his great cause. Hitherto I have not deprived myself of anything of consequence, but henceforth I propose to use corn bread and other substitutes for wheat; to go without butter as far as possible, and to cut down by nine-tenths at least my customary consumption of sugar. All this is of course important and advisable, but we must go further. We must cease to allow rats and mice and destructive insects to attack our food materials. We must do away not only with mosquitoes as disease carriers, but with flies, waterbugs and the like, as destroyers of food in pantries and cellars; we must be more careful not to let food deteriorate in our refrigerators and we must watch the garbage pail, first to see that nothing that is really good for food is thrown away, and second, that rats are not supported at our expense, perhaps through the garbage pail, to do damage to other things.

We need also to remember that many insects are now known to be disease transmitters, as is a particular mosquito when it carries malaria and another when it transmits yellow fever; as are fleas when carrying bubonic plague, and lice when carrying the germs of typhus fever.

As to the injuries wrought upon stored grain, I have the statement of the Curator of the Boston Society of Natural History, a distinguished entomologist, that the loss of stored grain due to insects is "enormous." Also that "about 40 species of insects are known to infest granaries," such for example as the granary weevil; the Mediterranean flour moth, the Indian meal moth, the common meal moth, beetles the larvæ of which are known as "mealworms," and a number of little flour and grain beetles,—all these besides the bean and pea weevils.

I appeal, therefore, to all dwellers in rural communities and especially to all school-teachers to inform themselves touching the ravages of rats, mice, and insects upon human food supplies, to the end that they may join hands with others in preventing these ravages, thereby increasing the available supply of human food, especially at present when food is so important to the winning of this war.

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THE WORK OF THE PUBLIC HEALTH COMMITTEE OF THE MASSACHUSETTS MEDICAL SOCIETY.

Dr. E. H. Bigelow,
Chairman, Framingham, Mass.

Read before the Massachusetts Association of Boards of Health, Pittsfield, Mass., October 25, 1917.

PRESIDENT LOWELL said last June, "We did not expect war, we were not prepared when war came, we know that peace will come, there will be no excuse if it finds us unprepared."

Can the Committee on Public Health help prepare for peace when it comes to Massachusetts?

No body of men can answer this question more effectively than the members of this association. The thorough administration of local health laws is vital at this time to the welfare of the state.

Three lines of effort appeal to the committee:

First. A study of the administration of health laws in the state. The committee recognizes the training and ability of many local boards and the intimate knowledge they possess of local conditions. We have sought through our agent in consultation with the members of the boards to study the difficulties met in the enforcement of health laws throughout the state.

Second. The establishment of an annual school for health officials in the state.

Third. The enactment of such legislation as may seem wise to promote the employment of full time health officials in towns and groups of towns.

Whatever the committee has accomplished the past year has been due to the untiring efforts of its agent, Mr. Edward J. Ingham, C. P. H. Men interested in the work have paid the salary of its agent, given him the use of an automobile and met the expenses of the school for health officials.

The committee has studied the public health situation in towns on the Cape and in eastern Massachusetts. The advantage of the smaller towns uniting in groups for administrative health work is obvious. It is the policy of the state in school administration, a group of towns uniting to secure the services of a competent superintendent.

I have followed the evolution of health work in a town of 16,000 people. The old board of health of which I was a member for several years was not efficient. Some years ago the the town joined the Wellesley group, sharing in the services of a full time health officer and a well equipped laboratory. Now this town has its own full time health agent, laboratory, and nurse. The appropriation for the health department this year in this town is $8,000, 50c. per capita.

We feel that the public is well abreast of the medical profession today in their interest in local health and sanitary matters. They are looking to this association to point out the way.

In school affairs the employment of a full time superintendent as executive officer for each town or group of towns with an unpaid school board is the well established policy of the state. Is it less important that the health laws should be executed by trained men?

The Convocation School of Instruction for Massachusetts Health Officials was held in Boston last month. Its success was due to Mr. Ingham and the coöperation of this association, the State Department of Health and the United States Public Health Service. Harvard and Tufts Medical Schools and the Institute of Technology opened their doors to the sessions of the school. Leading men and women in different departments of health work gave lectures and clinics without compensation.

The committee gratefully acknowledges its obligation to all who contributed to the program, ensuring its success. The attendance included health officers from the Berkshires to the Cape.

Mr. Ingham is preparing a report of the Convocation for the Boston *Medical and Surgical Journal.* We trust that Massachusetts may enjoy, with other states, an annual school for health officers.

The committee needs the counsel and support of every member of this association. It counts confidently upon such help and encouragement.

CONSERVATION OF CHILD LIFE.

DR. W. J. GALLIVAN,
Member of Council, State Department of Health, Boston, Mass.

Read before the Massachusetts Association of Boards of Health, Pittsfield, Mass., October 25, 1917.

AVAILABLE statistics on infant mortality from the warring nations of Europe show a decrease in infant deaths of 50 per cent. It is also estimated that this great saving of young lives will in one generation balance the enormous losses caused by war so that in twenty years those European nations which are conserving child life will be as numerically strong as they were at the outbreak of the war notwithstanding the immense losses reported.

Such an announcement stirs one's blood. American communities which have for years looked with complacency upon infant mortality rates in times of peace, much higher than European nations are reporting in times of the world's greatest war, ought to be shamed into action.

Always a pioneer in matters pertaining to health, Massachusetts under the leadership of Dr. Allan J. McLaughlin, State Commissioner of Health, has undertaken the work of child conservation.

The commonwealth has been divided into eight health districts. Each district is presided over by a full-time district health officer. To each district has been assigned a nurse, who will be assisted by a corps of volunteer aids. This machinery will be directed by a Committee on Conservation of Child Life appointed by the State Commissioner of Health.

It is planned to make a survey of every city and town, every village and hamlet in the state. This survey will include an exhaustive study of the mortality and morbidity statistics of children under the age of five years, the generally accepted period of school age, and a compilation of the agencies in each area which provide continuous, competent medical care. This survey will disclose the conditions.

The remedy for the condition will be applied by the Committee on Child Conservation who look upon local boards of health as their strong right arm in this venture.

The most profitable field for work is among babies during the first year of life. It is planned to use the excellent agencies already engaged in baby welfare work, and to stimulate the establishment of similar agencies in areas where little or no work is being done; and last but not least the medical profession who will be asked to refer to these agencies cases which are unable to obtain from privately employed physicians continuous, competent medical care.

In his "Four Years in Germany," Gerard says that much of the commercial success of the Germans during the last forty years is due to the fact that each manufacturer, each discoverer, each exporter knew that the whole weight and power of the government was behind him in his efforts to increase his business. So in this work of child conservation every agency engaged in baby welfare work will know that the enthusiastic coöperation and expert assistance of the State Department of Health will be behind them in their efforts to conserve child life.

The work of the committee is well under way. In some cities and towns, the survey has been completed and we are ready to go into these cities and towns and say, "In this city last year one hundred babies died. Of this number, ninety died of preventable disease. You have in this city a milk station where the feeding of infants can be supervised, but you have no facilities for expert obstetrical care, including pre-natal care. It is imperative that an obstetrical clinic should be established in this city. Every effort will be made by the State Department of Health to establish this clinic either through private or municipal aid."

And so over every square foot of Massachusetts this survey will be made, the condition noted, the remedy recommended, and the solution carried into execution.

The most important factors in child conservation are pre-natal care, obstetrical care, and infant feeding.

A recent report of the Children's Bureau at Washington states that 40 per cent. of infant deaths in this country occur during the first month of life.

Such a survey as we are making in Massachusetts would undoubtedly disclose the fact that such deaths in large part were due to pre-natal conditions, either medical, social or industrial. De Normandie says that any physician who has several cases of eclampsia occurring in his practice is not doing good obstetrics. The early recognition of the toxæmia of pregnancy, with its appropriate treatment, has reduced the number of cases of eclampsia so considerably as to be considered one of the achievements of preventive medicine. The Wassermann test to expectant mothers has revealed conditions which under treatment has reduced the number of still births and premature babies. Legislative action alone will prevent the disasters which befall parturient women who engage in industrial pursuits, either by the establishment of a minimum wage or by state aid to such women.

The minimum requirements for the proper conduct of an obstetrical case ought to be standardized by the State Department of Health. Cases which are unable to conform to the minimum requirements ought not to be cared for at home. The items which suggest themselves to me in the list of minimum requirements is careful prenatal supervision including monthly examination of urine; frequent recording of blood-pressure; pelvic measurements particularly in primiparæ; and perhaps the Wassermann test. The attendance of a hospital trained nurse at time of delivery is not a luxury. Expert assistance in operative cases should be insisted upon. Such minimum attentions to the expectant mothers of the commonwealth would materially assist in lowering our infant mortality rate.

Disorders of nutrition are responsible for the lion's share of infant mortality the world over. Everybody agrees that breast fed babies never die of enteric disease. Therefore, breast feeding should be universally encouraged by attending physicians. Bottle fed babies do well only under constant supervision of competent medical men. I know of no better way of securing such competent attendance than by bookkeeping methods of death returns.

The mortality rate of children from 1 year to 5 years, the generally accepted period of school age, is principally due to communicable disease and its sequalæ. Proper enforcement of existing regulations for isolation would do much to lower this rate. Teeth and tonsils are recognized as important objects of inspection during this period. Many an arthritic case with its resulting cardiac damage would be averted by early recognition of these sources of infection.

And so, we come to the school age where medical inspection of schools should carry on this work.

Such is the program contemplated. Coördination of existing agencies; elimination of overlapping if any such exist; creation of new agencies where required; publicity of the widest kind to annihilate the superstitions and errors which have prevailed concerning the occurrence of illness; and the punch which an enthusiastic and expert central body can exercise are the weapons relied upon to bring this work to a happy consummation.

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MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH.*

THE regular quarterly meeting of the Massachusetts Association of Boards of Health was held at the New American House, Pittsfield, Mass., Thursday, October 25, 1917.

The first Vice-President, Dr. John S. Hitchcock, presided in the absence of the president. It was voted to dispense with reading the record of the preceding meeting.

On recommendation of the Executive Committee, Dr. Frank A. Woods of Holyoke, Prof. James O. Jordan of Boston and Mr. James C. Coffey of Worcester were elected as a nominating committee to report to the annual meeting.

The following program was presented:

Address of Welcome. J. Arthur Baker, Esq., President of the Berkshire County Association of Boards of Health.

"The Work of the Committee on Public Health of the Massachusetts Medical Society." Dr. E. H. Bigelow, Chairman.

"Industrial Hygiene." Prof. W. Gilman Thompson, M. D., of New York City and Stockbridge.

"Child Conservation in time of War." Dr. W. J. Gallivan, State Department of Health.

"Rats and Insects as Public Enemies." Prof. W. T. Sedgwick, Massachusetts Institute of Technology.

The meeting was then adjourned.

Francis H. Slack, M. D.,
Secretary.

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*The composition expense of these proceedings is borne by the M. A. B. H.

THE RELATION OF STREPTOCOCCI TO BOVINE MASTITIS AND SEPTIC SORE THROAT.

DAVID JOHN DAVIS, PH. D., M. D.,
Chicago.

(From the Department of Pathology and Bacteriology, University of Illinois, Chicago.)

IN ENGLAND epidemics of sore throat, bearing some relation to the milk supply, have been recognized for many years. The first epidemic was reported as early as 1880 (Rugby). Since then many such epidemics have occurred.

In the United States the first epidemic of sore throat recognized as having a definite relation to the milk supply appeared in Boston in 1911. There is no doubt, I think, that many such epidemics have occurred in the past in this country, as well as in other countries, but on account of the almost universal prevalence of ordinary colds and sore throats their epidemic character and origin were not recognized. In the case of milk epidemics of scarlet fever, diphtheria, and typhoid fever, it may be pointed out that formerly their possible relation to the milk supply was not recognized or was denied, and only recently, when more intensive studies of such epidemics were made, was their true relation to milk supply established.

Since the Boston epidemic of 1911, similar outbreaks have been reported from Chicago, Baltimore, Boston (1912), Concord, N. H., Cortland and Homer, N. Y., Wakefield and Stoneham, Mass., Jacksonville, Ill., and from several other smaller towns especially in the east. The number of persons stricken in these various epidemics has been estimated as follows: Boston 1,400; Chicago 10,000; Baltimore 1,000; Boston (1912) 227; Wakefield and Stoneham 1,000; Cortland and Homer 669, and Jacksonville 348. Probably more than this number were affected since the above are all conservative estimates. This number is sufficient to at least give one some idea of the magnitude and importance of this type of infection.

In all, the onset, the character of the symptoms, and the later complications are strikingly alike and, it may be said, they agree in this respect with similar epidemics in other countries. The relation to the milk supply appears to be unquestionable in all. The interesting fact stands out that there is a certain uniformity in the reports in that the contaminated milk, though used perhaps by a small proportion of the people, still furnished a very high proportion (70, 80, or 90 per cent) of the reported cases. The remainder of the cases probably resulted from personal contact or from some other means.

Streptococci were unquestionably the cause of the disease in all the epidemics, having been found abundantly in the throats or in the secretions of the sick persons in all the cases investigated. This fact is of importance because it establishes definitely the etiology, and since the clinical symptoms in all the epidemics are so strikingly uniform, we may consider these infections as a definite clinical entity. They should, I think, take their place and be considered in text-books in medicine along with other infectious diseases, such as scarlet fever, measles, typhoid fever and the like.

As regards the nature of the streptococci, there is a fair degree of uniformity so far as the reports of the various investigators permit one to judge. They are all virulent, usually highly so, for animals. In general, they correspond, with only slight variations, in their morphology, in their cultural characteristics, and in their biological properties. In certain respects there are some slight differences between these streptococci and the ordinary *Streptococcus pyogenes*, and these differences have been sufficient to lead to the use of special terms. It should be stated that it may be questioned whether the differences between them and the *Streptococcus pyogenes* are sufficient to justify such a distinction. They may be simply highly virulent strains of the latter.

One of the properties noted in the streptococci from nearly all the epidemics is that of hemolyzing blood when the colonies are grown on human or rabbit blood agar. While there have been slight variations in the strains studied, they have been strikingly alike in this respect. By hemolysis is meant the formation of a well-defined, wide clear zone about the colonies in 24 hours at incubator temperature. It does not mean a slight halo occurring about the colonies nor does it mean a slight narrow ring of cleared media developing perhaps after 48 hours or more as occurs with certain strains of organisms. This property is of great importance because it is a very ready and practical means of differentiating such organisms from the common Streptococcus lacticus (Bact. guentheri) which is not hemolytic. These latter are practically always present in normal milk, and so far as we know are of no sanitary significance.

It is not to be understood that every hemolytic streptococcus is virulent or dangerous to man. But finding them in any considerable number in milk should make one very suspicious of udder disease, and such milk should at once be excluded from use.

The question of the source of streptococci causing these epidemics of sore throat is an important one. Two possible sources are recognized: the one bovine—the udder or teats of the cow; the other human—some lesion in the throats, hands, etc., of the milker or handler. It is a difficult matter to absolutely prove in a given case whether or not the infection is bovine or human in origin. This is because practically identical hemolytic streptococci occur in the diseased udders of cows and also in the throats and on the hands of the milk handlers. Furthermore, both streptococcal infections of udder in cows and streptococcal infections in the humans are relatively common; consequently, in an investigation of large numbers of cows and of milk handlers, as it is usually necessary to do in studying these epidemics, one is apt to find instances of one or the other and draw conclusions accordingly. On the other hand, the real source of streptococci may be overlooked on account of some hidden focus of infection in the throat or tonsils of a milker which could not be detected in an ordinary throat examination. Or a cow might be suffering with inflammation of the udder and discharging millions of streptococci in the milk and still, as the writer has shown experimentally, the udder may show no physical signs of the disease and might thereby escape detection on inspection. For these reasons it is readily seen how one might be misled in his conclusions when looking for the ultimate source of streptococci.

I assume that streptococci capable of causing epidemics may at times have their origin in human lesions such as the throat of a milker and through coughing, sneezing, spitting, handling, etc., may pass directly into the milk. This mode of milk contamination we are familiar with in connection with several infectious diseases. I wish here to present experimental evidence showing that it may also be possible for streptococci originating from a person to first infect the teats and udder of the cow, and this source may then continue to furnish virulent streptococci for a long time to the milk.

For some time I have been especially interested in the experimental side of the subject. In our study of the epidemics of sore throat in Chicago in 1911 and in Jacksonville, Ill., in 1914, this question of the susceptibility of the cow to human streptococci arose, as well as the reverse question. In collaboration with Doctor Capps, the writer has shown that hemolytic streptococci of human origin, when introduced by catheter into the healthy udder of a cow, continue to grow and are shed for a considerable period of time, and that their growth is accompanied by certain evidences of mastitis. Experiments made by swabbing human streptococci about the meatus of the healthy teat do not give rise to an ascending infection, but when the teat is injured by scarifying, the streptococci ascend the ducts and cause an infection manifested by marked increase in leucocytes, the presence of large numbers of the hemolytic streptococci but not necessarily by any external physical signs. The streptococci continue to be shed in the milk for a long period of time. In our experiments at the end of four weeks there were still large numbers of streptococci and leucocytes in the milk.

From the above experimental results it would seem that it is possible for streptococci to pass directly into the udder from a human source such as the throat or hands of the milker, to thus infect the cow's udder and after multiplying there pass out into the milk and infect the consumer.

These results have been confirmed and extended recently by Mathers* working with us in Chicago, who has studied especially the behavior and effects of streptococci of human and bovine origin when grown for a long period of time in the udder of the cow. This work is summarized as follows:

Hemolytic streptococci of human origin from sore throat produce mastitis in cows, when injected directly into the milk ducts. This mastitis may be severe leading to a caked bag and later to a chronic inflammatory condition which results in an atrophy of the mammary gland. On the other hand, virulent hemolytic streptococci may grow and multiply in the milk ducts of a cow without causing any visible changes in the udder. The milk, however, contains hemolytic streptococci and an increased number of leucocytes. These infections may persist over long periods of time in the form of a chronic mastitis. In three infections at the end of 215, 186, and 146 days, respectively, there was no evidence that these infections were subsiding.

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*Jour. of Inf. Dis., 1916, Vol. 19, p. 222.

Streptococcus lacticus (nonhemolytic) produces a very acute infection of the udder when cultures are injected directly into the milk ducts. This infection was of short duration (12 days) and left the gland fundamentally unchanged.

A nonpathogenic hemolytic streptococcus of the type commonly found in normal milk may give rise to a transitory inflammation of the udder when injected directly into the milk ducts, producing a mastitis similar in every detail to that produced by nonhemolytic Streptococcus lacticus.

The presence of pathogenic streptococci and an increased number of leucocytes in milk is indicative of a mastitis, and may be the sole indication of mastitis.

The quarters of a cow's udder under experimental conditions are apparently separate as regards infection. One quarter may be infected, while the others remain normal. Examination of the milk from each quarter of the udder is necessary before mastitis can be excluded in a suspected cow.

In three cases of experimental bovine mastitis, all of which were due to hemolytic streptococci with all the characteristics of the human types, no noteworthy changes were observed in the morphology or cultural characteristics of the invading organisms in frequent examinations of the milk throughout the course of the infections. The distinguishing characteristics primarily noted for each organism were still present at the last observation, and there were no modifications which might be considered as indicating change from one type to the other.

The cultural and morphologic characters of Streptococcus lacticus and of the hemolytic streptococcus derived from normal milk did not change any during the course of the udder infections which they induced.

In a recent paper Theobald Smith and J. H. Brown* showed that streptococci, which were the agents of a number of outbreaks of sore throat were "all alike in that the colonies produce immediately around them a clear hemolyzed area on blood agar plates (horse blood)." They state: "Our studies, extending over more than a year and a half, have shown that cultures from throats affected with tonsillitis contained at least two types of streptococci well differentiated on horse blood agar plates. Our attention was largely restricted to one of these types, a streptococcus producing around the colony a clear zone three to four millimeters in diameter. This type corresponds with the hemolytic strains of the earlier milk-borne epidemics of tonsillitis (Boston, Chicago, and Baltimore). Within each of these groups a close analysis of morphological characters did not bring out differences beyond slight variations in the size of the cocci, but on culture media differences were evident." They divide streptococci on the basis of hemolysis into two types: Type A, in which the colony has a partly discolored and hemolyzed mantle between it and an outer clearer zone; and Type B, in which the colony is surrounded by a clear zone of hemolysis. The former are nearly always nonpathogenic for rabbits; the latter are commonly pathogenic for rabbits except two strains of the B type and possibly one of the A type. Smith and Brown, in looking for a sufficient reason for these explosive epidemics of tonsillitis, in addition to the possible contamination of the milk during milking or later, point to the possibility of the occasional infection of the udder ducts with human streptococci. Such a possibility would be supported by the discovery of hemolytic streptococci of the human type in the milk (Outbreak B) from a cow in the suspected herd; also by the discovery in the mixed milk in the study of another epidemic (Outbreak G) of a strain not distinguishable from human pathogenic strains. The ordinary mastitis or garget streptococci, he infers, are different from streptococci of human tonsillitis and do not cause that infection in man. Only rarely might human types find their way into the ducts through manipulations, and continue to be shed into the milk for some time.

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*Jour. Med. Res., 1914, 31, p. 455.

Recently Krumwiede and Valentine* reported a milk epidemic in Rockville Centre, Long Island, in which they found in one cow the wide-zone hemolytic streptococci of the human type. They present evidence which they have interpreted as showing that the epidemic was largely caused by the udder infection of the cow, but that, in conformity with the assumption above discussed, this cow had itself been infected with human streptococci from a milker who was suffering from sore throat.

It should be pointed out that nonhemolytic or feebly hemolytic streptococci commonly cause a distinct and long enduring mastitis in cows. I have isolated a number of such strains in pure culture directly from the inflamed udder of cows. They appear in the gargety milk in long chains and in large numbers. These organisms are harmless for rabbits unless one injects large doses (two or more blood agar slants); then arthritis may develop. My impression from the data in the literature and also from my own experience is that such streptococci are not infrequently the cause of mastitis, but there is no evidence at present to indicate that they are dangerous to man.

Organisms of this type include many of the streptococci in milk usually designated as Streptococcus lacticus. Most of these cause a green discoloration in blood media, but some may be feebly hemolytic, conforming in this regard with Smith and Brown's Type A; others cause no appreciable alteration of the surrounding media.

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*Jour. Med. Res., 1915, 33, p. 231.

These organisms likewise are relatively avirulent and so far as is now known, possess no sanitary significance.

In view of these facts I have recently studied further a collection of hemolyzing streptococci from market milk obtained under various conditions including both pasteurized and certified milk. I was especially interested in the question as to whether pathogenic hemolytic streptococci of the human type were found at times in such milk. These streptococci from market milk were also compared with a collection of human hemolytic streptococci as regards various properties especially their pathogenesis for animals.

Especial attention was given to the study of the property of heat resistance on account of its relation to pasteurization.

Only those streptococci were selected whose colonies were surrounded by a distinct clear zone of hemolysis on human blood agar plates (Type B, Theobald Smith).

The feebly hemolytic streptococci (Type A) were often noted in the milk but were not collected and studied since the interest in sore throat epidemics has centered about the cocci with a clear wide zone.

Three hundred and twenty-eight sample specimens of bottled milk were collected from different dairies in the city of Chicago. Excepting 45 samples from one dairy which furnished certified milk all the specimens were pasteurized: and with the exception of two dairies (17 samples) the holding process was used.

The time of the year during which these examinations were made was from October to March.

Blood agar (human) was used in plating and the counts were made after incubation at 37°C. at the end of 48 hours. The colonies of hemolytic streptococci were carefully noted and counted and later their identity was confirmed by further tests.

Eighty-five samples yielded on culture streptococci of the strongly hemolytic variety. The number in different samples varied considerably ranging from a few hundred to several thousand per cc. In the certified milk they were about in the same proportion as in the pasteurized samples. From one dairy in 16 specimens of milk no hemolyzing streptococci were found. In all others some were found.

A study of these 85 strains of hemolyzing streptococci was made as regards their morphology, cultural characteristics and certain other properties. They vary considerably among themselves. They are more resistant to heat than human strains of hemolytic streptococci and possess little or no virulence for rabbits; therefore in all probability not for man. They rapidly acidify and coagulate milk and grow well at 20°C. They may form short or long chains but as seen in milk they often appear in pairs or a chain of a few elements. While they are all definitely hemolytic (Type B, Theobald Smith) the characteristics of the hemolytic zone on plates may vary in certain respects.

These milk strains are different from certain strains of hemolytic streptococci found at times in diseased udders in cows. These latter resemble the strains of hemolytic streptococci from human sources. They are virulent for rabbits.

The question of pasteurization is an interesting one in relation to these infections. In the case of several epidemics in this country the infected milk had been pasteurized by the "flash" method and the evidence in all indicated quite clearly that the milk was contaminated before pasteurization. Nothing further need be said, therefore, concerning the absolute inefficiency of the "flash" method. The harm it may do by giving people a sense of false security is also self evident. In certain epidemics the milk was consumed raw. It would seem that our only safeguard against such epidemics is efficient pasteurization not only of the milk and cream, but also of the material entering into the manufacture of other milk products. It is a point of some importance that it is not uncommon for firms to sell pasteurized milk but to sell cream in the raw state. The latter is of course even more dangerous than milk.

The question as to what constitutes efficient pasteurization for streptococci is one that evidently requires further study. It is commonly stated in the literature that pathogenic streptococci are killed at relatively low temperatures (52–54°C. for 10 minutes, Sternberg). Undoubtedly for many strains this is altogether too low. The recent work of Ayers and Johnson indicated that the thermal death point of typical streptococci varies considerably and one of 22 strains studied by them resisted heating for 30 minutes at 62.8°C. (145°F.) the usual temperature for pasteurization. Furthermore their viability in milk and milk products should be carefully studied since we know that media may exert an important effect on the resistance of organisms to heat.

In my own work in which 98 strains of streptococci were tested none of 24 pathogenic hemolytic streptococci of human origin resisted 60°C. (140°F.) for 30 minutes. Twenty of 74 strains of hemolytic streptococci of milk origin and having practically no virulence resisted 68.3° C. (155°F.) for 30 minutes. I know of no evidence to indicate that strains of streptococci pathogenic to man can resist the usual temperature for pasteurization (145°F. for 30 minutes).

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ACTIVATED SLUDGE AND THE TREATMENT OF PACKINGHOUSE WASTES.

Langdon Pearse,

Division Engineer, in Charge Sewage Disposal Investigations, the Sanitary District of Chicago.

Read before the Sanitary Engineering Section, American Public Health Association, October 18, 1917, at Washington, D. C.

INTRODUCTION.

WITH the concentration of packinghouses near or in large cities, the problem began of treatment to avoid nuisance. In Chicago this condition arose in the early 60's. In other localities the difficulties appear of more recent origin. Economies enforced by competition have now reduced the losses so that in the large houses every possible by-product is sought. However organic material escapes with floor washings, paunch manure, etc., which is troublesome, both as suspended matter or in solution. In the treatment of these liquid wastes the activated sludge process appears particularly promising.

RAW SEWAGE.

The character of the raw sewage varies with the local conditions. The experiments of the Sanitary District have been conducted on a mixed domestic and packinghouse sewage (Center Ave. sewage), containing by volume perhaps 25 per cent of domestic sewage. The experiments of the packers have been conducted on the effluent from individual houses, containing considerably higher amounts of suspended matter as well as organic matter in solution (Table I).

TABLE I.

TYPICAL ANALYSES OF PACKINGHOUSE SEWAGE. PARTS PER MILLION.

Source	Nitrogen as—				Oxy. Cons.	Chlorine	Suspended matter			Alkalinity
	Total Org.	Free Amm.	Nitrites	Nitrates			Tot.	Vol.	Mixed	
Center Av.[1] Day	79	22	0.49	3.04	268	1100	505	461	144	291
Night	...	..	....	....	...	....	163	112	51	...
Halsted St.[2]	260	28	....	....	257	365	428	344	84	340
Ashland Av.[3] Day	73	20	0.21	1.97	245	920	860	657	203	358
Night	34	18	0.08	0.86	70	537	....	...	...	237
Armour & Co.[4]										
Hog House Day	...	..	....	....	...	....	903	...	...	...
Night	...	..	....	....	...	....	449	...	...	...
Swift & Co.[5] Day	56	26	....	....	290	....	937	815	122	278
Night	21	9	....	....	92	....	222	181	41	210
Wilson & Co.[6]	194	78	....	....	466	....	1040	990	50	395
Armour & Co.[7], Fort Worth	...	..	....	....	...	....	3000	...	...	...

NOTE—Chicago Analyses from Report Industrial Wastes, 1914, (1).

[1] Average, 1913.

[2] July 28, 1911, 4 hrs.

[3] Fourteen day samples, ten night samples, 1913.

[4] May 23 to 25, 1911.

[5] June 6 to 10, 1911.

[6] June 29 to July 1, 1911.

[7] Verbal statement Mr. W. C. Moore, Chemist, Armour & Co., Fort Worth.

TESTING WORK—GENERAL.

The early tests on packinghouse wastes were made at Fort Worth about 1901, on a strong sewage direct from the house. The devices tried included single story settling and septic tanks, intermittent sand filters and aeration. No direct record is available of the results, but the conclusions drawn by the packers point to odors, expense and large areas required for works.

In 1912, the Sanitary District began a campaign for the treatment of industrial wastes and as part of the work, established a testing station in which were tried grit chambers, screen (fine and coarse), settling in single and two story tanks, chemical precipitation (both with alkali and acid), and sprinkling filters. The results were published (1) at a time when the activated sludge process was just being talked of. The testing work was therefore extended to cover the activated sludge process. Preliminary studies in cans 2 feet in diameter by 10 feet deep proved very encouraging. Larger scale experiments were begun early in 1916, and have been continued since. They have been successful in demonstrating the adaptability of the activated sludge process for handling packinghouse sewage mixed with domestic sewage.

TESTING STATION — THE SANITARY DISTRICT OF CHICAGO.

The activated sludge plant originally consisted of a rotary screen, four tanks in which the sewage is aerated, one tank for settling the aerated sewage, one sludge storage tank, two blowers with motors for supplying air, a sludge pump for returning the sludge to the aeration tanks from the settling tank, or the sludge storage tank, and a Venturi meter with recording apparatus for determining the quantity of air used.

The rotary screen is of the Weand type, cylindrical in shape, 2 ft. 4 in. diam. by 4 ft. 8 in. long, covered with 30 mesh brass wire screen, supported on a ½ inch mesh screen. In the summer of 1917, the 30 mesh screen was replaced by a 20 mesh.

The four aeration tanks are each 6 x 23 ft. in plan, 12 ft. deep, inside dimensions, of 3 inch Oregon fir, well bolted together, with air distributors of filtros plates set in hopper bottoms of concrete faced with hollow tile. The plates are arranged differently in each pair of tanks. The ratio of plate area to tank area is approximately 1 to 6.3 in both the tanks with one row of plates down the center and those with the rows transverse to the length of the tank. After remodeling, the effective plate area was found to be 1 to 8. The capacity of each tank is about 11,000 gallons to the flow line. The tanks were first connected in series and provided with inlet and drain pipes, so that they can be operated separately on the fill-and-draw plan, as well as a whole with continuous flow. The air system is arranged with a main header to each tank, from which branch pipes feed each set of plates. Three small Venturi meters are provided to set on the main header lines in a by-pass to check up the flow of air to each tank.

The circular tank is 12 ft. in diameter with 12 ft. staves, built with a hopper bottom of the Dortmund type, originally with a slope of 0.6 vertical to 1 horizontal. The sewage enters the tank in the center near the bottom, the settled sewage passing off from the top around a peripheral weir. As the length of the weir is great and the sheet of water passing over proved very thin, "V" notches were cut in the crest to facilitate adjustment. The tank is provided with a sludge pipe for discharging the sludge onto the drying beds, and a suction pipe to the sludge pump.

An old circular Dortmund tank, 8 ft. outside diameter, with 10 ft. staves, has been fitted up as a sludge storage tank. It can also be used as a settling tank in connection with one of the aeration tanks.

Two rotary blowers of the Connersville make, Boston type, belt driven, supply the air for the plant, one with a capacity of 300 cu. ft. per min. against a pressure of 6 lbs. per sq. in., driven by a 20 H. P. motor, the other with a capacity of 150 cu. ft. per min. against a pressure of 10 lbs., driven by a 10 H. P. motor.

After considerable experiment, the settling tank was remodeled and the bottom hopper slope made 60 degrees with the horizontal. A straight flow settling tank was also added, with steep hopper bottom slopes. Later the plant was changed again to permit of separate aeration of the sludge followed by settling before pumping the concentrated sludge back to mix with the incoming sewage. The period of aeration in contact with the sewage has been cut. The amount of air used is somewhat less than when the sludge was aerated entirely in contact with the sewage.

SUMMARY OF ACTIVATED SLUDGE RESULTS.

The Sanitary District experiments (2) on the activated sludge up to March, 1917, have shown that the following conditions must be met:

1. The sewage should be screened with a fine mesh screen. Thirty mesh has been used. This removes from 600 to 1,000 pounds of dry material per million gallons of day flow.

2. The screened sewage can be aerated in continuous flow tanks using 4 cubic feet of air per gallon of sewage, with an 8 hour contact period of sewage and activated sludge. This will produce an effluent, practically stable in summer conditions.

3. Sufficient sludge storage capacity in the aeration tanks should be provided to care for at least 140 per cent of the sewage entering the tanks. Actually from 40 to 80 per cent of the incoming flow is returned from the settling tanks, as a mixture of sludge and sewage.

4. The depth of the tanks has been taken at 16.5 ft. over the plates. The air distribution proposed is through filtros plates set in unit boxes of cast-iron, the ratio of filtros plates to the superficial area of the tank is 1 to 6.

5. The system provides the following approximate recovery of solids:

Grease as scum 360 pounds per million gallons, as grease 47 pounds per million gallons.

Screenings 600 to 1,000 pounds of dry material per million gallons of flow.

Sludge 2,000 to 3,000 pounds of dry material per million gallons.

TESTING WORK. ARMOUR & CO., SWIFT & CO., WILSON & CO.

Armour & Co. have made an extensive study of the treatment of individual house effluents both on the hog house at Chicago (3) and on the combined outfall for Armour and Swift at Fort Worth (4). The results sought have been largely from the standpoint of determining the availability of material recovered for fertilizer. The Chicago results approximate those of the Sanitary District.

At Fort Worth, however, a very strong sewage has to be handled, because owing to the scarcity of water, waste is cut to a minimum. The trend of the experiments as judged from the published data (3) and a personal visit to Fort Worth, indicates that for the strong packinghouse waste at Fort Worth:

1. Preliminary screening is necessary. Thirty-two mesh wire screen has been used.
2. Preliminary sedimentation, accompanied by grease removal is desirable.
3. Dilution of the strong sewage will facilitate treatment.
4. In the aeration of the sludge contact with the liquid, 35 per cent sludge is desirable.
5. Re-aeration of sludge in a separate tank improves the sludge.
6. A stable effluent, well clarified, can be made.
7. The air consumption will be high, averaging from 6 to 9 cubic feet of air per gallon of sewage with a 10 hour period of contact.
8. The use of acid in de-watering the sludge coagulates the sludge both quickly and readily, reducing the moisture content below 85 per cent.

Wilson & Co. (when known as Sulzberger Sons Co.), ran a small testing plant on the effluent of part of the packing house. Quantitative data is not obtainable, but examination showed clarification accompanied by recovery of solids.

Swift & Co. have built an extensive experimental plant on a sewer containing typical concentrated packinghouse sewage. Although practically completed a year ago, the plant has not been operated to date, owing to press of war business.

ARRANGEMENT OF TANKS.

The best arrangement of plant is not yet determined. Two schemes have been tried by the Sanitary District, one in which the sludge is aerated entirely in contact with the sewage, the other in which the sludge and sewage are aerated for a short time, the settled sludge however being re-aerated and re-settled before return to the initial point. The latter arrangement has shown somewhat smaller requirements in the amount of air, and a reduced volume of sludge to be returned.

STABILITY OF EFFLUENT.

The amount of air noted in the experiments of the Sanitary District (4 cu. ft. per sec. per gal. of sewage) is apparently sufficient to produce a practically stable effluent in summer weather. In the winter, with the same amount of air, the effluent is of lower stability, when tested by incubation at room temperature. If a stable effluent is then required, 6 cu. ft. or more of air per gallon of sewage may be needed, according to the temperatures of the sewage and air.

MIXED *vs.* UNDILUTED WASTES.

Although the evidence to date is not absolutely conclusive, the indications are that a mixed domestic and packinghouse sewage is more amenable to treatment, than the strong packinghouse sewage. This indication is apparently confirmed by the results at Fort Worth.

AIR DISTRIBUTION.

The distribution of air appears at present to be best served by the use of filtros plates. Perforated pipes have been tried both at Chicago and Fort Worth. More air is required than with the filtros. The ratio of gross area of plate to tank area at Chicago was 1 to 6.3 with net area of 1 to 8. At Fort Worth, 1 to 7, has been used.

BAFFLING AND AGITATION. TANK DESIGN.

Considerable study is required on both domestic and industrial sewage to determine the best design of tanks. In this connection the design of the bottom of the aeration tanks deserves attention. In England, Jones and Attwood have worked out a saw tooth design (5). In the United States, Nordell at Milwaukee has worked out a design with a curved bottom, the plates being placed eccentric to the center of the tank (6). At the Chicago testing station simple baffling has been tried, with different arrangements of shallow hoppers in the bottom. No directly comparable results are available.

SLUDGE SETTLING.

Following aeration of the mixed sludge and sewage, the sludge is settled out. The experience of the Sanitary District indicates that the period may be short, $\frac{1}{2}$ to 1 hour, and that the bottom slopes of hopper bottom tanks should be about 60 degrees with the horizontal. Velocities should be low. The sludge may be removed continuously by air lift or centrifugal pump. Flat slopes around 45 degrees or lower appear to encourage "hanging" and consequent septic conditions. A straight flow settling tank worked.

The required settling period, however, depends vitally on the condition of the sludge and may vary also with the season of the year.

SLUDGE TREATMENT.

The handling of the sludge is probably the most knotty problem of all. In the Sanitary District work, with screened sewage, exclusive of screenings, about 46,500 gallons of liquid sludge, containing 99.2 per cent water accumulated per million gallons of sewage over a period of nine months. This is equivalent to 2,420 pounds of dry solid per million gallons. The amount of dry solids per million gallons appear to vary between 1,100 and 4,500 pounds exclusive of screenings. The screenings caught on a 30 mesh screen will vary from 500 to 1,200 pounds of dry material per million gallons of day flow. During a period of 6.5 months the reduction of suspended matter was 2,820 pounds as against a sludge removal of 2,680 pounds of dry material per million gallons.

The essential point is to remove the water. Various expedients have been tried, which may roughly be subdivided into (1) settling, (2) the use of coagulants, including both alkali and acid, (3) filter pressing. Centrifuging has not yet been tried at Chicago.

With very liquid sludge, direct filter pressing is difficult, owing to the large amount of liquid to be handled. Preliminary treatment by settling with or without acidification is very helpful. Quiescent settling from 3 to 6 hours will reduce the moisture content to 98 or 98.5 per cent. The addition of about six pounds of sulphuric acid per thousand gallons of sludge (containing 98 per cent moisture) seems to aid in filter pressing, and makes a sludge which leaves the cloths cleaner. A 2.5 hour pressing with acid treated sludge is equivalent to 3½ to 4 hour pressing with settled sludge. Moreover, acid treated sludge apparently keeps better and shows a somewhat higher nitrogen content.

The effect of acid on activated sludge is not at all the same in different places. Apparently on the Sanitary District sludge, the effect of acid is a minimum, whereas at Fort Worth, on packinghouse activated sludge, the addition of acid produces a rapid coagulation, with immediate flotation of the sludge, the moisture content being quickly reduced. The water used in the packinghouses there is very high in alkali. The sludge can be further reduced by drainage and retreating to about 85 per cent moisture or lower. This phenomena does not appear at Chicago. Furthermore it is estimated at Fort Worth that about 11,000 pounds of dry material can be recovered per million gallons.

Plain settling has considerable value in reducing the moisture content. However, the effectiveness is conditioned on the condition of the sludge. The settling is not as marked as on domestic sewage at Milwaukee or on packinghouse sewage at Fort Worth.

Filter pressing has been tried by the Sanitary District on a small "Simplex" press, with plates 15 by 15 inches square, loaned by the Simplex Ejector Co., and demonstrated by Mr. Buckley. This press was the one used at Milwaukee, the results there being described in reference 6, with the addition of six radial ribs on each plate. The plates in the press have perforated steel strainer plates over the corrugations. Cakes from ½ to 1⅞ inches have been made in from 2 to 4 hours pressing, with pressures varying from 20 to 150 pounds, according to the character of the sludge and the preparatory treatment. Occasional steaming helped in keeping the cloths clean. The moisture content of the cake was varied, in general being around 80 per cent.

SLUDGE ANALYSES.

There appears to be considerable fertilizer value in activated sludge. Analyses show a high nitrogen content, compared to the screenings (Table II). Occasional analyses show press cake,

TABLE II.

TYPICAL ANALYSES OF SCREENINGS AND SLUDGE, THE SANITARY DISTRICT OF CHICAGO.

Source	Per cent moisture	Calculated to dry weight			Ether soluble		Remarks
		Fixed	Volatile	Org. N.		Acidified	
Screenings............	80.7[1]	4.7	95.3	2.18	5.9	9.4	Average 3 mos.
Sludge...............	99.15	37.4	62.6	4.17	6.00	9.25	Average 9 mos.

[1] Moisture content average of 9 months.

particularly with acidified sludge, running from 5 to 6 per cent of nitrogen on the dry basis.

SCREENING.

The value of fine screening as a treatment preliminary to aeration is worth consideration. Our experiments show that a 30 mesh screen will remove from 500 to 1,200 pounds of dry material per million gallons of day flow. The screenings contain about 80 per cent moisture after natural drainage. The nitrogen content is low, equivalent perhaps to barnyard manure (Table II). The material is largely paunch manure. The material removed is the coarser suspended matter, consequently the amount of depositing material is lessened, which may tend to collect in the depressions of the aeration tanks. From the operating standpoint the removal of this material by screens seems desirable, as it is largely inert, of vegetable origin and slow to decompose. From the standpoint of handling the sludge, however, when the screen is running the sludge is somewhat harder to press. The screenings seem to act as a fibrous binder which aids pressing.

RECOVERIES.

The general indications at Chicago are (Ref. 2, p. 27–27) that grease and fertilizer may be recovered. The grease may be worth about 4 and 7 cents a pound at normal and war prices. The activated sludge, dried, if containing regularly 5 per cent of ammonia may be worth about $12 per ton dry, under normal conditions, or possibly $18 per ton under present war conditions.

ODORS.

The activated sludge testing plant operated at Fort Worth, at Chicago by Armour & Co. and by Sulzberger & Co., and by the Sanitary District have been remarkably free from odor. The sewage tested in all cases has been fresh.

COSTS.

The exact costs of plants for handling packinghouse wastes have still to be determined. Approximate estimates made by W. D. Richardson and the author for the conditions in Chicago (2) are subject to revision as better data is obtained, particularly in the costs of handling the sludge. As yet no large scale plant has been operated as a complete unit. For the 50 million gallon daily plant, the first cost, exclusive of land, was estimated at $3,752,000. The annual cost, including interest, depreciation, and operating charges was estimated at $822,000, of which $270,000 was for electric power. The power was figured on a sliding scale which averaged about 0.7 cents per k.w. hour. Including power the annual operating charge was estimated at $455,700.

Recoveries are uncertain in both value received and amounts. However at normal prices an income of $150,000 to $300,000 may result, and at war prices $250,000 to $450,000, depending on the quality and quantity of material recovered. These results will help reduce the gross annual cost given above.

FURTHER DEVELOPMENTS.

Further development in the activated sludge process appears to be along the lines of reducing the amount of air used, improvement of settling tanks, and the more rapid reduction of water content of the sludge. Such development will tend to reduce both construction cost and operating charges.

The reduction in the use of air may be obtained along the lines of development in the design of tanks, to promote mixing and distribution of air, and possibly along the line suggested in England of intermittent application of air.

The improvement of settling tanks is in a transition stage. The steep hopper bottomed tanks are effective. However, other devices may be workable, such as the Dorr tank, particularly where the returned sludge is re-aerated separately and re-settled before return to the inlet.

Ways and means of reducing more rapidly the water content of the sludge should be studied, either in preparation for filter pressing or as a direct preliminary to drying. This is a complex problem, verging on the domain of physical chemistry.

CONCLUSION.

The activated sludge process offers the best promise of a solution of the problem of treating packinghouse waste of any suggested up to the present time. For the study of conditions in Chicago the construction of a unit plant has been recommended to handle 1.5 million gallons per 24 hours, to obtain working results on a large enough scale to determine the design of the final plant.

In conclusion the writer wishes to acknowledge the courtesy of the chief engineer of the Sanitary District of Chicago, Mr. George M. Wisner, for the use of information, and the assistance of Mr. J. J. Newman, assistant engineer, who has charge of the experimental work under the author's direction.

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NOTES ON ACTIVATED SLUDGE TEST AT CLEVELAND.

R. Winthrop Pratt,
Consulting Engineer, Cleveland, Ohio.

EARLY in 1915, following the completion of an extended series of tests at the Cleveland sewage testing station, of all methods of sewage treatment which were considered feasible under local conditions, there were started, on a small scale, experiments on the activated sludge process, using the tanks and other equipment which were available at the testing station. These experiments were sufficiently encouraging to warrant an investigation of the process on a larger scale.

Accordingly, an activated sludge plant was constructed in the fall of 1915 and placed in operation. This plant has an aeration tank capacity of over one million gallons per twenty-four hours, and a sedimentation tank capacity of about one-half million gallons per twenty-four hours. The plant was designed as a preliminary unit of a possible future plant for treating eighty to one hundred million gallons per day, or approximately one half of Cleveland's sewage. Thought was also given in the design to the possibility of changing the unit into a two story sedimentation tank, in case the tests did not warrant the adoption of the activated sludge process for the larger installation. (For description and plan of plant see *Engineering News*, April 6, 1916.)

Crude Sewage.

The sewage treated in the activated sludge plant is obtained from the outlet of the main or easterly intercepting sewer, which discharges into the lake near the testing station, the flow in the sewer being from sixty to two hundred and fifty million gallons per day. The sewage is subjected to some slight sedimentation in a shallow grit chamber before being diverted to the plant. Analyses show that the suspended solids in the applied sewage amount to about two hundred and fifty parts per million, and that considerable iron is present this averaging twenty-five parts and sometimes reaching three hundred and fifty parts.

Degree of Purification Desired.

The problem of sewage treatment at Cleveland, at least at the two plants which are to be built on the lake front, has been regarded as one which involves simply clarification rather than the production of a highly nitrified effluent. The tests are being made with the idea of using a minimum amount of air consistent with obtaining clarification, and at the same time producing sludge of suitable composition. It should be remembered, therefore, in comparing the Cleveland tests to those made elsewhere, that the process has been studied locally from the standpoint of securing an effluent which could be disposed of in Lake Erie without causing offensive conditions or polluting the bathing beaches.

It is the writer's intention to indicate in a very brief manner, some of the data which have been obtained and the principal conclusions which have been reached to date. The following summary is therefore submitted herewith:

NOTES ON THE PROCESS AS REGARDS THE PRODUCTION OF A CLEAR EFFLUENT.

A clear effluent which will be stable for thirty-six hours may be produced with three-fourths cubic feet of air per gallon of sewage, with two hours aeration, and using twenty-five per cent activated sludge.

Three-fourths of one hour aeration in addition to that necessary to produce clarification, is necessary to remove iron color.

There are no odors connected with the process of obtaining a clear effluent; but the disposal of sludge presents more difficulty.

Economy demands the careful adjustment of air to the varying sewage flows.

The hydro-turbine type of blower used in the tests eliminates clogging of the filtros plates by dust and oil.

The filtros plate diffusers apparently clog with fine particles of sludge or iron deposits, and when thoroughly wet, the plates tend to soften and crumble.

The design of settling tank is very important and should be such as to prevent the formation of septic conditions in the bottom of the tank; and there is much to be learned in regard to tank design.

Temperature apparently has little or no effect upon the activated sludge process; but all piping is carefully protected from the weather.

The efficient depth for the aeration tanks depends upon conditions governing the construction of the plant rather than upon the relative saving in air with tanks of different depths.

NOTES ON PROCESS AS REGARDS DISPOSAL OF SLUDGE.

An inoffensive and economical method of disposal of the sludge appears to be the most important feature in connection with the use of the activated sludge process at the main treatment plant at Cleveland. This plant will be located on a restricted area in a residence neighborhood; and it is necessary that every precaution be taken to guard against odors of sewage origin.

When activated sludge is drawn from the bottom of the sedimentation tanks, it is, under normal conditions, inoffensive; but within a day or two it will commence to putrify and become foul, unless the moisture is greatly reduced. If, however, this sludge is aerated for a period of from five to ten days, using air at about five cubic feet per gallon of sludge per day, it will become more stable.

Tests made on digesting activated sludge in a plain tank, 10′ x 7′ x 20′ deep, adding sludge at the top and drawing off sludge at the bottom every forty-eight hours, have given unsatisfactory results to date, as the sludge drawn off is very offensive. It is believed it is possible, however, that by operating a digestion tank somewhat along the lines of the process which takes place in a two-story sedimentation tank, better results may be obtained.

A large number of tests on dewatering the sludge by draining on sand beds, showed that the area required would be too excessive to be practicable on the site available for the main plant at Cleveland. The minimum period to date, for drying sludge to seventy-five per cent moisture is seven days.

Four hours sedimentation of the sludge on the sand beds, results in concentrating the sludge from about 97½ to 95 per cent moisture, thus reducing its volume 50 per cent, after the supernatant water has been drawn off. The above data and other tests on settling sludge, suggest the use of shallow concentration tanks.

Centrifuging the sludge in a rotary laundry machine showed that this process would reduce the water from 98 to 80 per cent, forming a cake three-fourths inch thick, but that there are many practical difficulties connected with operating a centrifugal machine, at least of the type tested. It would be well to test other types however.

From experience at the testing station in pressing Imhoff sludge in a Sweetland press, and in view of much general data on sludge pressing, it is believed that this method is the most practical one now available for dewatering the sludge down to a point where it could be used as a fill or further dried for use as a fertilizer ingredient. No actual tests, however, have been made at Cleveland on pressing activated sludge.

Tests made at the Cleveland garbage reduction plant, and at a local rendering plant on drying sludge to a ten per cent moisture were not satisfactory. The material "balled" and caked hard on the outside without drying on the inside. When mixed with garbage tankage, however, at the rate of one-half to one-half, much better results were secured.

Analyses of the sludge shows an average ammonia content of less than 4 per cent of which about one-half is found to be "available" by analytical methods. These figures, it will be noted, are low when compared to published ammonia values of activated sludge at other plants.

The final disposition of the sludge after it has been dewatered to 60 or 70 per cent, is a question of cost. If the actual market value of dried activated sludge having 4 per cent ammonia should exceed the difference between the combined cost of heat drying and preparing for market, and the cost of dumping, then drying eqipment should be installed and the sludge sold. If the market price does not exceed the difference computed as above, the sludge should be dumped.

NOTES ON COST.

Based on treating 500,000 gallons per day, the cost per million gallons of the activated sludge process may be summarized as follows:

Power	$ 7.50
Labor	15.00
	$22.50

The above labor item contemplates continuous attendance and of course, much more sewage could be treated for this amount, hence the cost per million gallons of labor item as well as the power item, would be greatly reduced with a large plant.

The cost of electricity at Cleveland, for use at the sewage plant, has been three-fourths cents per kilowatt hour.

From the above, it will be seen that the question of the necessity of continuous supervision has an important bearing on the cost of the process, when used with small installations.

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LIFE INSURANCE COMPANIES AND PUBLIC HEALTH.

On another page in this issue appears the address of Dr. Charles J. Hastings, President of the American Public Health Association, as delivered before the Association of Life Insurance Presidents. Doctor Hastings in this forceful address points out that great strides have been made by public health agencies in the reduction of mortality. In certain large American cities, for example, the typhoid death-rate has from 1910 to 1916 been reduced from 19.6 per hundred thousand to 8.7, and other death-rates have been correspondingly reduced.

The life insurance companies have in the past reaped abundantly from the fruits of public health activity; nevertheless they still pay enormous sums because of deaths from preventable diseases. The furtherance of the public health movement on the part of the companies is, therefore, not a matter of charity, but of sound business policy; and since the public health movement has been greatly hampered by lack of funds for propaganda, the coöperation of the life insurance companies with the American Public Health Association to form "the greatest life saving crew in the civilized world" is indeed a desirable relation.

We are informed that the attitude of the Life Insurance Presidents at New York City was favorable, and that their support is to be expected.

Doctor Hasting's article will be read with great interest by insurance men and health officers alike. It is a skillful demonstration of the fact that public health is a sound business proposition,—probably the most effective of all arguments for the support of efficient health administration.

A GIFT OF WAR TO PEACE—TRAINED PUBLIC HYGIENISTS.

Along with the carnage of the present struggle between nations come many blessings. The promotion of national unity, the subordination of personal comfort to the national welfare, reduction in the use of alcohol, the inculcation of thrifty habits into the population—these must be included as an important part of the history of the War.

Not the least of these gifts of War to Peace will be the small army of soldiers and officers trained in public health. As was pointed out by Dr. Evans in the November issue of this JOURNAL, there will return to us after the war probably in excess of 20,000 men well versed in military hygiene, from the Army Medical Corps, the Engineering Corps, the Red Cross Sanitary Service, and other agencies.

Unquestionably, one of the greatest obstacles to progress in public health has been the lack of trained men. In the prospective return of the war sanitarians, therefore, lies one of the greatest opportunities for good in the history of public health.

The end of the war is by no means in sight, but the time to begin planning to exploit this opportunity is the present. The public must be made ready to receive these men, so that when the time comes, the necessary appropriations will be forthcoming; and a machinery must be created to complete connections between the man and the job. The first task will be the most difficult, and will take the longest time, as anyone will agree who has tried to obtain new legislation. While many a cause has been lost by being launched too early, a much larger number have failed because of the lack of a well-organized plan and a thorough campaign of preliminary education. It seems wise, therefore, to take the first step at once; namely, for state health officers to mention the subject in their bulletins, with the information that a detailed program of action will be forthcoming at a later time.

When the end of the war is in sight, an intensive campaign should be conducted to stimulate the demand for the returning war hygienists, but it would be too late to leave all preparations until that time. The time to get ready for war is in peace-time, and *vice versa*.

Turning our attention to the men now engaged in service, a number will doubtless choose to return to their former occupations; a large number, however, should be glad to enter the new profession of public health, provided openings are available.

The logical agency for linking the men with the positions is the American Public Health Association. Through its Health Employment Bureau it has already furnished lists of applicants to a large number of prospective employers. The new problem will simply involve an expansion of this activity.

THE CONTROL OF COMMUNICABLE DISEASES.

The issue of *Public Health Reports* for October 12, 1917, contained an exceedingly valuable report: that of the Committee on the Control of Communicable Diseases of the American Public Health Association. Our knowledge on this subject is constantly undergoing revisions, owing to the revelations of bacteriology, epidemiology and allied sciences; and year by year, definite principles of control are developed where formerly only tradition or guess-work prevailed. So rapid has progress been that many legal regulations are wholly out of accord with the best scientific views: the typhoid carrier frequently is permitted to roam unmolested, leaving a trail of disease and death wherever he goes, while the inoffensive contact to a case of diphtheria is quarantined, although a bacteriological examination might show that he was free from diphtheria bacilli.

In the report in question, we find authoritative views upon the modes of transmission of the important communicable diseases, and recommendations for the control of both patient and contacts,—all based upon the latest discoveries in sanitary science. The report should form an invaluable guide to those who wish to inform themselves upon the subject, and for a basis of legal enactments for the control of communicable disease.

A NEW HEALTH EMPLOYMENT SERVICE.

The war has withdrawn from civil health positions many men, particularly between the ages of 21 and 30. This has created an unusual demand for public hygienists at salaries between $1,200 and $2,500 per year. The situation is most acute with regard to positions paying less than $2,000 per year, because the younger men have gone to the front in large numbers.

In order to assist in the solution of the employment problem, the AMERICAN JOURNAL OF PUBLIC HEALTH will supplement the activities of the Health Employment Bureau of the Association by carrying "help wanted" announcements free of charge.

In sending announcements for insertion, please give the following information: 1. type of position; 2. the salary offered (important); 3. the qualifications demanded (academic training, experience, etc.); 4. type of employer; 5. address for reply.

A common mistake in advertising for assistance is to insist upon the medical degree for positions which do not require that qualification. Again, the qualifications demanded will be all out of proportion to the salary offered. Recently a request was received for a woman physician to fill a position at $1,200 per year. It is doubtful whether a really competent physician could be found for the work at $2,000 per year.

If the prospective employer so desires, replies may be addressed to a key number, care of the JOURNAL. Such replies will be promptly forwarded. The publication date of the JOURNAL is the 15th of the month. If announcements are received on or before the first of the month, they can always be inserted in the issue of that month. Insertions can sometimes be made on the proof as late as the fifth, but in general, the earlier announcements are received, the less the chance of error or omission.

ADDITIONS TO THE STAFF OF THE JOURNAL.

We take pleasure in announcing the addition to the staff of the JOURNAL of Dr. E. R. Hayhurst, of the State Department of Health of Ohio, and Dr. M. E. Champion, of the State Department of Health of Massachusetts. Doctor Hayhurst will take charge of the Industrial Hygiene Notes, and in this work will be assisted by Dr. P. M. Holmes and Dr. R. P. Albaugh. Doctor Champion will review for the Public Health Notes.

In this busy age, when the reading of long articles is difficult, notes sections are exceedingly valuable to the reader who wants his information in compact form. Our experience is that many readers turn to these first upon receiving the JOURNAL.

It is a source of great satisfaction to know that the notes are prepared by men of ripe experience and broad vision.

LATE APPEARANCE OF THE DECEMBER JOURNAL.

The withdrawal of a number of men by the military draft from the plant of our printer caused a considerable delay in the appearance of the December JOURNAL. The announcement of the increase in subscription rate therefore reached subscribers after the announced last date for renewing at the old $3.00 rate. This date will therefore be extended until February first.

SOME REASONS WHY LIFE INSURANCE COMPANIES SHOULD ALLY THEMSELVES WITH THE AMERICAN PUBLIC HEALTH ASSOCIATION.

DR. CHARLES J. HASTINGS,
President of the American Public Health Association.

Address before the Association of Life Insurance Presidents, Dec. 7, 1917, at New York City

Mr. Chairman and Members of the Association of Life Insurance Presidents.

GENTLEMEN: Permit me, on behalf of the American Public Health Association, to thank you most cordially for the high honor you have conferred on our association by inviting me to say a few words to you concerning an alliance.

Inasmuch as economy and thrift are the watchwords of the day, the importance of your organization as a national asset and as a nation building organization is now being emphasized as never before. I take it that you have in force insurance to the amount of approximately one-fifth of our entire national wealth. But, however incomprehensible this huge financial responsibility may be to the man outside the realm of finance, the directors of this great nation building organization can see beyond the policy, the physical and moral welfare of the policy-holder.

Anything that makes for the deterioration of our race is inimical to the life insurance business, and we all have forcibly impressed on our minds today, as we never had before, the value of human life, human efficiency and man power. Every nation in the civilized world today realizes that brain and brawn are its most valuable national assets. We are giving freely of our man power, and thousands are paying the supreme penalty every day. Approximately seven millions of the best blood of all the nations have already been sacrificed. Your nation will soon be paying the price that we, in Canada, have already paid to the extent of over thirty-five thousand of the noblest of our boys. Think for a moment what the biological effects of this will be on our nations. One can quite appreciate what it will mean to breed a generation from men who are physically unfit, and the significance of this is emphasized when we couple with it the fact that 60 per cent of your men drafted for service and from 40 to 50 per cent of ours have been rejected as physically unfit. The defects in the germ plasm will manifest themselves in the new generation who, I may say, will not constitute first-class insurance risks, and they will require much greater protection against the invisible foes of the race. Is it not time that we recognize the handwriting on the wall and organize for greater and still nobler national service?

If the American Association of Life Insurance Presidents would join forces with the American Public Health Association, the parent organization of preventive medicine on this continent, they would constitute a dynamic force for nation building that governments would have to reckon with. Is the time not opportune for mobilizing and organizing against the invisible foe?

The most appalling feature in connection with the present war is the sacrifice of human life. Over four million of the best of the nations comprising the Entente Allies have already fallen.

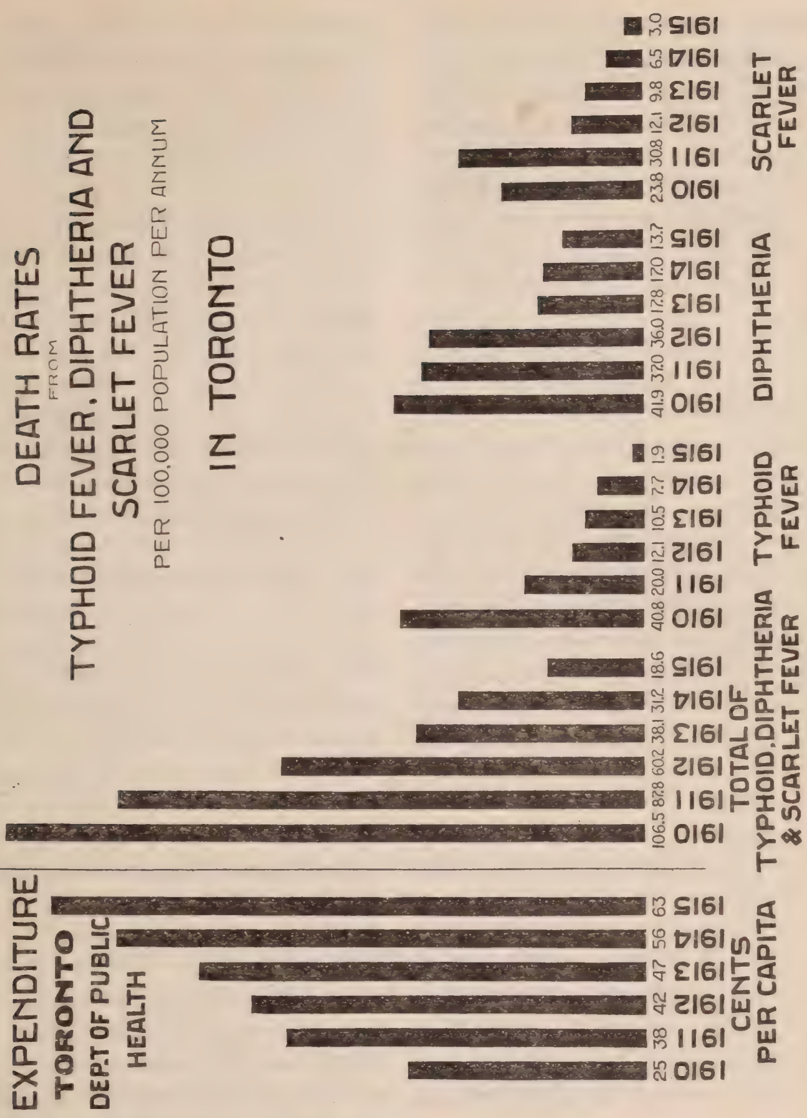
But what about the war against the invisible foes of the race? It is estimated that in times of peace 7,500,000 die of preventable diseases every year in all the nations engaged in war, and probably an equal number are handicapped for the balance of their lives through the sequelæ of the diseases to which their comrades have succumbed.

What is being done to combat the ravages of these invisible foes, and with what results? A limited number of cities, states and provinces in the United States and Canada have mobilized their forces and, through educational campaigns and other activities to arouse public sentiment, have succeeded in securing the sinews of war necessary to combat in a measure the more formidable of these foes, such as typhoid, tuberculosis, gastro-intestinal diseases of infancy and childhood, yellow fever, malaria and diphtheria.

The most outstanding result obtained is the reduction in the mortality and morbidity from typhoid fever. The typhoid death-rate in fifty-seven large American cities, representing an aggregate of twenty million people, has declined from 19.6 per hundred thousand in 1910 to 8.7 in 1916. Even this rate of 8.7 per hundred thousand is more than double what it should be in any city where the water supply is made safe at all times by filtration and chlorination and where the milk supply is made safe by scientific pasteurization. The rates in these cities vary all the way from 2.8 to 44.6 per hundred thousand. The fact that some cities have rates fifteen times as great as others shows clearly that much remains to be done in the prevention of typhoid fever.

The tuberculosis death-rate in the United States, it is claimed, has been reduced 50 per cent in the last twenty-five years and yet the cost of tuberculosis to life insurance companies is still enormous. According to Professor Irving Fisher, the total cost per annum to seven of the largest companies in New York amounts to over eleven million dollars. In some companies it constitutes from 20 to 25 per cent of the total loss, and yet we know that this disease is preventable if we are willing to pay the price.

The general death-rate for the registration area of the United States has been reduced 16 per cent in the last ten years. Yet we know that this is due, for the most part, to our reduced infant mortality and to the reduction of mortality from communicable diseases, especially typhoid and tuberculosis. There has been practically no organized effort, excepting in a very few municipalities, to control industrial diseases, the degenerative diseases of adult life, cancer and venereal diseases, all of which are of vital concern to the life insurance company, and to the student of economy, as they take their toll in the most productive period of life.



The reduction in mortality already obtained has been accomplished for the most part by but a few of the larger urban centers where they have whole-time health officers and well organized departments of health, with fairly adequate appropriations for the work. These serve, however, to demonstrate the possibilities of efficient public health appropriations and administration and we are, therefore, convinced that, as Doctor Biggs has expressed it, "Any municipality can have as much health as it is willing to pay for," provided, however, that there is efficient organization and administration.

There are thousands of towns, villages and rural municipalities in the United States and Canada in which there is no public health organization or administration and many others that only have half-time health officers and in most of these cases they would be better without any, inasmuch as they ofttimes afford but a false security.

The American Public Health Association has for nearly half a century constituted a bureau of information, a medium of education, a support and an impelling force behind public health administrators on this continent. However, we feel that the time has come for more aggressive action. We want to organize all over the continent, Health Societies in every state of the Union and province in the Dominion, through which we can hope to educate and enlighten the people as they have been enlightened in the larger cities. Through these state Health Societies, with which we hope to secure the coöperation of all existing activities in the state or province, we hope to disseminate knowledge of the real source of disease and the ways and means by which diseases are transmitted and so convince the people that these diseases are preventable, that they will in turn insist that they be prevented.

In order to bring about this result, we must first secure the sinews of war. In looking around for these, we were a unit in concluding that we must endeavor to secure an alliance with the American Association of Life Insurance Presidents, inasmuch as your association, second only to our own, is most concerned in prolonging human life, controlling disease and developing a fitter race. You are, today, the greatest promoters of thrift on this continent, consequently the greatest benefactors of the race. By an alliance with the American Public Health Association in an organized campaign against the invisible foe, we would, together, constitute the greatest life saving crew in the civilized world.

Someone may ask, why should life insurance companies enter the war against these invisible foes? You are the trustees for nearly thirty billions of the people's money. The reason why we feel that you should be in it is this. It has been estimated that from 40 to 50 per cent of the deaths in this country are preventable or postponable. It must be apparent to all of us that every life saved or death postponed means an addition to the dividends of the policy-holder and consequently a decrease in the cost of insurance. Your companies last year paid out in claims approximately $256,000,000. How much of this was paid out for preventable diseases?

It has for years been inconceivable to me why life insurance companies have not interested themselves in the prevention of disease and the extension of life, as a business proposition. Actuaries have estimated that a reduction of one-third of the mortality would mean a reduction of 15 per cent in the premiums. The cost of insurance is governed, for the most part, by the death-rate. Other factors enter into it, but they are comparatively insignificant. An investment, say, of one-tenth of one per cent of the amount paid annually in death claims, in prevention of disease and prolonging of human life, would return to your policy-holders dividends tenfold greater than from any other investment.

Furthermore, the moral effect on the thirty-five to forty millions of policy-holders and their friends, of the knowledge that Public Health is of sufficient importance to engage the active coöperation of all the Insurance Companies on this continent, would in itself be of inestimable value. This would also give these millions of policy-holders a direct monetary interest in public health.

How can this coöperation best be accomplished?

We have in our association three types of membership, the regular member, the sustaining member and the corporate member. The annual fee for the corporate membership is from $50 up. What we suggest is that the representatives of the life insurance companies become corporate members, the annual fee to be optional or governed by the volume of business.

Obviously, in order to carry out the true principles of democracy we are desirous of having every insurance company take out corporate membership. We will not ask you to engage actively in any branch of public health work. We have the organization, we have the machinery for extending our activities, we have the vision and the determination of purpose, we have a full comprehension of the strength of our enemies and the character of their entrenchments. We ask you to help us finance the war against a common foe.

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Resolution Adopted by the Association of Life Insurance Presidents at New York City, December 7, 1917.

Coöperation with The American Public Health Association.

Whereas, The improvement in public sanitation through the efforts of local health boards is one of the most important and valuable results achieved in the field of preventive medicine; and the life insurance companies should be and are peculiarly interested in the progress and success of all movements which tend to prolong the term of human life; and

Whereas, The American Public Health Association is engaged in the work of promoting the enactment and enforcement of more scientific and effective health laws, and of giving expert advice upon methods of health board organization and health law administration; now therefore be it

Resolved, That the life insurance companies of the United States are earnestly recommended to become members of the American Public Health Association and that their representatives be encouraged to give personal aid to all efforts intended to improve local sanitary conditions.

Association News.

By the Secretary, A. W. Hedrich

The Committee on Advertising.—With the new year, the Committee on Advertising is beginning an active campaign for more advertising under the chairmanship of Dr. W. A. Evans, who served the Association so efficiently as president, last year.

The country has been divided into twenty-six districts, each in charge of a committee member. Every member of the Association is further invited to send in a list of prospective advertisers, who, in his opinion may be interested in taking space.

When studied, the advertising appeal of the Journal is surprisingly broad. We customarily think of Journal readers as purchasers merely of supplies for health departments, hospitals, welfare departments, etc. In addition, every reader has personal needs to fill.

But perhaps the most valuable phase of Journal advertising is the indirect publicity gained—the publicity relayed by the sanitarian to the general public. For example: the Universal Portland Cement Company advertisement calls the attention of the health officer to the sanitariness of concrete milk houses; MacAfee emphasizes the efficiency of an air humidifier; the Railway Utility Company offers help on the vexing problem of street-car ventilation. When the health officer is convinced of the usefulness of these products for the promotion of public health, he is only too glad to pass this information on to others. The health officer may not himself buy, but he has enormous influence in causing others to buy. There are hundreds of such products which may, and should be advertised in the Journal: narrow mouth milk pails, pasteurizers, sanitary drinking fountains, egg candlers, chlorinating devices, sputum cups, etc.

Can you send us a few names from your community?

The Committee on Advertising with their districts, as appointed by the chairman, follows:

Chicago—Dr. W. A. Evans.

New York—Dr. H. D. Pease.

Boston—A. W. Hedrich.

New England (outside of Boston)—Dr. J. O. Jordan.

Philadelphia—Dr. Joseph S. Neff.

Baltimore and Maryland—Dr. C. Hampson Jones.

Buffalo—Dr. F. E. Fronczak.

Pittsburgh—Dr. J. E. Edwards.

New York (outside of Buffalo and New York)—Dr. F. W. Sears.

Pennsylvania (outside Pittsburgh and Philadelphia)—Dr. S. H. Gilliland.

Delaware—Dr. G. W. Hudson.

New Jersey—Dr. F. H. Edsall.

Ohio, Indiana, Illinois—Dr. J. N. Hurty.

Cleveland—Dr. C. E. Ford.

Cincinnati—Dr. J. H. Landis.

Michigan—Mr. Guy L. Kiefer.

Milwaukee—Dr. G. C. Ruhland.

North and South Carolina—Dr. Chas. T. Nesbitt.

New Orleans—Dr. W. H. Robin.

Richmond—Dr. E. L. Flanagan.

Southern States—Dr. O. W. Dowling.

St. Louis—Dr. G. A. Jordan.

Kansas City—Dr. H. DeLamater.

California—Dr. W. A. Sawyer.

Washington and Oregon—Dr. T. D. Tuttle.

Denver and Rocky Mountain States—Dr. Omer R. Gillette.

District of Columbia—Dr. W. C. Woodward.

Wisconsin—Dr. C. A. Harper.

Detroit—Mr. Henry F. Vaughan.

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The Washington Resolutions.—The Secretary has received letters thanking the Association for the resolutions passed at the Washington meetings from the following persons:

Surgeon-General W. C. Gorgas, U. S. A.

Surgeon-General Rupert Blue, U. S. P. H. S.

John D. M. Lean, Sec. Com., States Activities and Examinations, General Medical Board, Council of National Defense, by Direction of Dr. Franklin Martin.

Asst. Surgeon-General W. H. Frost, for the Red Cross Sanitary Service.

Mr. Thomas Grant, Secretary, Washington Chamber of Commerce.

Dr. P. P. Claxton, U. S. Bureau of Education.

Mr. Herbert C. Hoover, Director, U. S. Food Administration.

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Leon A. Congdon, who for the past four years has served as Division Chief, Food and Drugs, Kansas State Board of Health, has recently resigned that position, and has received a captain's commission in the Sanitary Corps of the Medical Reserve Army service.

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The following applicants were elected to membership in December:

Benjamin W. Brown, M. D., Surgeon U. S. P. H. Service, Charlotte, N. C.

Harold A. Patterson, M. D., Instructor in Bacteriology, University of Buffalo, Buffalo, N. Y.

William F. Peterson, M. D., Army Medical School, Washington, D. C.

Raymond Pearl, M. D., U. S. Food Administration, Washington, D. C.

Elizabeth C. Lowry, R. N., Princeton, W. Va.

L. E. Spencer, M. D., Deputy State Health Officer, Wausau, Wis.

Loren Johnson, M. D., Washington, D. C.

H. J. Ramsey, Pomologist, U. S. Dept. of Agriculture, Washington, D. C.

E. W. Murray, M. D., Newark, N. J.

G. E. French, M. D., Alyria, Ohio.

Walter A. Scott, M. D., Health Officer, Niagara Falls, N. Y.

H. M. Conklin, Sanitary Engineer, Ames, Iowa.

Jos. S. Lawrence, M. D., Pathologist, State Board of Health, Albany, N. Y.

Hurbie Andrews Taylor, M. D., International Health Board, Hamburg, Ark.

L. M. Fisher, Assistant Engineer, Pennsylvania State Health Department.

David A. Heynem, West Philadelphia, Pa., student, University of Pennsylvania.

George E. Hoyt, M. D., Deputy State Health Officer, Milwaukee, Wis.

Burton R. Rogers, D. V. M., Chicago, Ill.

Harold G. Osborn, City Chemist and Bacteriologist, Dept. of Health, E. Chicago, Indiana.

HELP WANTED.

Note.—Until further notice, help wanted announcements will be carried in this column free of charge. For further information, please see the editorial pages of this issue, where a detailed statement is made.

A south central state is in need of an epidemiologist who will also be instructor in hygiene at a university. Salary: $2,500 per annum. Address H. A., No. 85, care of this Journal.

A city in New York State, population 30,000, desires a full-time medical health officer. Salary, $2,500. Address this Journal, J. S. W., No. 86.

A young food chemist with some experience in food, drug, and toxicologic work is wanted in a state health department, north central state. Salary: $1,500, with early prospect of $1,800. Address A. L., No. 87, care of this Journal.

Medical health officer and inspector wanted by north central state health department. Salary: $2,000. Address W. B. H., No. 89, care this Journal.

Chemist and bacteriologist with knowledge of pathology wanted in New Brunswick Province, Canada. Salary not stated (probably $1,500 to $1,800). Address H. J., No. 90, care this Journal.

Young woman physician wanted in a central state to take charge of a public health car. Salary, $1,200 and expenses. Address D. A. L., No. 91, care this Journal.

City bacteriologist wanted in a south Atlantic state, city of 65,000. Salary: $1,650. Address, S. S. P., No. 92, care of this Journal.

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Thus does the busy fly
Improve each shining hour,
Washing his "tootsies" in the milk
And causing it to sour.

He spent his health to get his wealth
And then, with might and main
He turned around and spent his wealth
To get his health again.
—*Buffalo Sanitary Bulletin.*

Books and Reports Reviewed.

The Battle with Tuberculosis and How to Win It. A Book for the Patient and His Friends. *D. MacDougall King, M. B. J. B. Lippincott Company, 1917. Pp. 258. Cloth, $1.50.*

This book is a volume of 258 pages attractively bound and printed. There are a few illustrations and an appendix. The author has written this book with a sincere and earnest desire to do good and to a certain group of patients it undoubtedly will do good. It is open to the same criticism as are many books of this class, in that it is too long and goes altogether too far into the realms of medicine, taking up subjects which might better be left to the physician. The use of military phraseology throughout the book, in the reviewer's opinion at least, is out of place; rather a pleasing novelty in the first page or so it soon becomes distinctly irksome.

The subject of treatment by tuberculin is a distinctly medical one and might well be left out. The author's remarks concerning spitting are likewise rather those of an extremist and are hardly sound or practical.

The author comments upon the medical profession and upon the ethics of this profession. The majority of these comments are sound but there are certain ones which are out of place. He speaks of the sanatorium as being "more of a hotel or boarding school than a hospital." This is hardly the right impression to give. The author is evidently an ardent believer in the climate of the West and South and hardly emphasizes the fact sufficiently that the advantages of such climate are open to only a very small percentage of patients. One notes with pleasure, however, his statement that "It is criminal for a doctor to send a patient away from home with the advice to live out-of-doors, to exercise freely, and to consult no physician."

The chapter on Home Treatment is excellent. The chapter on Diet while containing much valuable information is arranged in such a way that it may lead to trouble. He states for instance, that "many patients are able to consume daily as much as a gallon or even one gallon and a half of milk," and likewise "that from 3 to 30 eggs a day may be taken." It is a pity that such statements as these are not qualified.

In the Appendix he considers the use of disinfectants but does not sufficiently emphasize the best disinfectant in the world, mechanical cleanliness, consisting of elbow grease and soap and water, nor does he sufficiently emphasize the value of fresh air and sunshine.

On the whole, this book contains much valuable information and will be of value to patients of sufficiently high intelligence to grasp it; its atmosphere is sound and optimistic. Although the reviewer believes it to be too long, and that its value would be increased were certain medical subjects omitted, he strongly commends its evident sincerity and plain speaking.

John B. Hawes, 2nd, M. D.

The War and the Trend of National Vitality. *E. E. Rittenhouse, Commissioner, Public Service and Conservation, The Equitable Life Assurance Society of the United States.*

In an interesting little pamphlet whose statements are backed by figures, Rittenhouse takes as his text the disillusionment as to the physical vigor of the American young man, attendant on a study of the results of the examinations for army and navy. Under the suggestive caption, "A Vast Army in the Discard," he quotes the report of the Surgeon-General of the Navy for 1916 in which the statement is made that out of 106,392 applicants under the age of 30 for the navy, 70 per cent were rejected. This proportion is further borne out in examination of 3,400 boys applying for the Naval Academy. Figures available would indicate that there are in this country about five million men between the ages of 21 and 31 who are physically unfit for military service.

How can we square these facts with the fact of the decline in the general death-rate which has been going on for some years? The answer seems to be dependent on a study of causes of death by age periods. Such a study reveals the following information:

"1. The general death-rate (the number of deaths per 1,000 living) has apparently decreased only up to the age group 45–50, and increased beyond that point.

"2. The average duration of life (or years lived) of the total population has increased, not because people live longer after passing middle life, but because of the great saving of lives in infancy and the early age periods.

"3. The decrease in the death-rate in the younger ages is due not to an increase in the power of the blood and organs to resist disease, but almost wholly to the fact that we have learned how to avoid and to treat certain poisons, namely, germ diseases—typhoid fever, tuberculosis, diphtheria, etc.

"4. The increase in the death-rate commencing about 45–50 is apparently due to the marked increase in mortality from diseases of the heart, kidneys and other important organs, which indicate a decline in vitality.

"5. While the death-rate has increased in the United States only in the first four decades of life, it has decreased in England and Wales and most European countries at all ages, old and young. This disposes of the theory which occurs to so many that the increase of the death-rate in our older age periods is due to the saving of lives in the early age groups.

"6. The presence of a large number of adult immigrants in our population can account for but a very slight portion of the increase in the death-rate from degenerative diseases and for the increase in the general death-rate above age 45–50. This is demonstrated by the fact that the general death-rate in our native white population of native parents shows virtually the same downward trend of the vitality curve as it does in the total population.

"7. Between the last two census years, 1900–1910, the death-rate from the group of most important organic diseases of the degenerative class in the population above age 30 increased 28 per cent while the increase of the proportion of foreign and negro population combined was but 2.6 per cent in that group."

The author points out that "the general effect of the war upon the vital strength of the present generation and of posterity will be far from favorable." Many men will be greatly impaired and more will suffer by a lowered resistance to disease. Moreover, many of those who remain at home will show the bad effects of the speeding up inevitable to maximum effort in a limited time. As a remedy for the conditions he discusses, Rittenhouse suggests the trite yet fundamentally sound one of education—of child and adult—in methods of right living. He further insists upon the need of seeing to it that the knowledge thus gained is put into practice.

Merrill E. Champion, M. D.

Good Health and How to Keep It. *A. H. Doty, M. D. D. Appleton & Co., N. Y., 1917.*

In "Good Health and How to Keep It," Dr. A. H. Doty covers a lot of ground. The first sixty pages briefly sketch human anatomy and physiology. The next eighty pages are devoted to sanitation covering such a wide range of subjects as water, food, air, ventilation, heating and lighting and disposal of waste. Personal hygiene is briefly treated, the subject consuming thirty pages. The hygiene of the environment covers hygiene of the school, home and workshop and something about mosquitoes and flies. Bacteria, infections and a few bacterial diseases, disinfectants and deodorants are grouped together. The final chapter is on first aid. The book is written for the layman.

W. A. Evans, M. D.

Annual Report, Orange, New Jersey.

The ninth annual report of the Health Department of the City of Orange for 1916 shows that, largely as a result of the occurrence in that city of three wide-spread epidemics—influenza, measles and infantile paralysis—the annual death-rate per 1,000 population advanced from a rate of 11.6 for 1915 to 13.9 for 1916.

In addition, the infant mortality rate increased from 75 per 1,000 births in 1915 to 92 per 1,000 in 1916. This increase is believed to be due to the same cause as that which increased the general death-rate. The infant welfare work of this city, however, despite this increase was most effective, its results being shown in the decrease in deaths due to other causes. Though an increase in population was reported for this city, the birth-rate decreased to the lowest rate since 1898, namely, to 23.3 births per 1,000 population. This marked change was largely due to the falling off of the birth-rate of the Italian population of the city, which constitutes nearly one-fifth of the total population of 33,080.

Six hundred and fifty-seven deaths were reported, the chief causes of death being pneumonia and broncho-pneumonia, 208; organic heart disease, 187; tuberculosis, all forms, 154; cancer, 99; infantile paralysis, 60; external causes, 54; brights disease, 48; apoplexy, 42. Deaths from pneumonia and broncho-pneumonia have increased so that they constitute 14.7 per cent of the total resident deaths. Such an increase is attributed in the main to complications resulting from measles and influenza. Fourteen cases of typhoid fever were reported, 8 being resident cases. The death-rate from typhoid was 6 per 100,000.

Orange, situated so closely to the origin of the 1916 epidemic of infantile paralysis, suffered accordingly. Ninety-one cases of this disease were reported, with 20 deaths. Diphtheria, scarlet fever, and tuberculosis maintained practically the same low levels as were attained in 1915.

The report is prepared with a nice regard for proper sequence, and relative values of the subjects discussed. Among the recommendations a dental clinic is asked for, and with this the health of the city in conjunction with the coöperating surrounding cities and towns should be well maintained. *A. D. Hiller.*

The Principles of Mental Hygiene. *By William A. White. M. D. Macmillan, 1917. Pp. 323. $2.00.*

This book is broadly conceived and repays careful consideration. From its inclusiveness and philosophic spirit it becomes of necessity somewhat hard reading. But it constantly stimulates and challenges the student, generally winning him in the end to the doctrines set forth. A unifying thesis which runs through all the chapters is the following: Man's inheritance calls him back to the primitive, the tried, the familiar. Progress is made only as this conservative force is resolutely overcome. The insane are those who fail to meet the demands of real and exacting conditions, retreating into a world of their own making. Criminals to a less degree exemplify this regression.

The author appeals for humanity and patience in dealing with defectives of every class, for constructive rather than repressive measures. The standard maintained is a social one: the psychasthenic is the man who does not help his fellows, the normal human being is the philanthropist. There is an interesting statement of the aims of psycho-analysis and in this connection the great importance of the influences bearing on child-life is urged. A plea is made for more extended and authoritative instruction for medical students in psychiatry and psychotherapeutics.

Percy G. Stiles.

Public Health Notes.

Abstracted by Dr. M. E. Champion and M. P. Horowitz.

Venereal Diseases Among United States Soldiers.—The *Weekly Bulletin* for October 27, 1917 of the New York City Health Department prints an interesting table showing the relative prevalence of venereal disease in the Regular Army, National Guard and National Army. The figures indicate that the source of venereal infection is in the civilian population, and it is suggested that that is where the evil must be fought. The table follows:

	Cases	Rate
Regulars, U. S. Army in U. S. only, 1916	——	91
Regulars in U. S. Week ending Oct. 12, 1917	214	51.6
National Guard all Camps and Dept. Week ending Oct. 12, 1917	660	96.7
Natl. Army, all Camps ending Oct. 12, 1917	1689	204.8

Demand for Sanitarians.—The United States Public Service Reserve, Department of Labor, Washington, D. C., is in need of health officers, sanitary engineers, bacteriologists, etc. Sanitarians in search of employment should write to the Reserve at 1712 I St., Washington, D. C., attention of Mr. A. D. Smith.

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Psychology and Military Activities.—In *Mental Hygiene* for July, 1917, this subject is discussed by Robert M. Yerkes of Harvard University. The war has brought to our attention the realization that the solution of numerous psychological problems is just as urgent for efficient action, as the solution of more material problems. The task of the psychologist is to determine whether certain men are fit for some particular branch of the service, and if not, whether they cannot be utilized in some other branch, with the maximum efficiency.

Considerable attention has been given already to the selection of naval gunners and aviators. In the first group the characteristics sought are quickness, accuracy, steadiness and endurance. In the second group, the rapidity, definiteness and accuracy of reaction of each individual are determined.

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Fundamental Principles of Public Health Nursing.—Mary S. Gardner, writing in Public Health Nursing gives what may be called the eight fundamental principles of public health nursing:

1. That only well trained nurses should be employed.
2. That the nurses should not be distributors of material relief.
3. That there should be no interference with the religious views of the patients.
4. That the rules of professional etiquette should be rigidly observed.
5. That coöperation in all its forms should be recognized as of primary importance.
6. That suitable and accurate records should be kept.
7. That patients unable to pay for nursing care should receive free services, and that those able to pay for it should do so according to their means.
8. That the daily working hours of the nurse should be limited, in order that good work may be done and they themselves be kept physically well.

This number or classifications of fundamentals is by no means final. Each year brings changes and developments undreamed of in the beginning, and requiring adaptability of method and administration if progress is to be made.

(*M. E. C.*)

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Education of the Tuberculous.—Dr. Lee G. Guyer in the St. Paul *Medical Journal* says:

"There is, perhaps, no more important factor in the care of the tuberculous than training and instruction. No other patient requires training so much as he does; no other patient is in better position to take training and education. The typhoid patient is too sick to care about anything but his headache, or, in his convalescence, too hungry to think of anything but his appetite. The pneumonia sufferer is too busy breathing to give thought to anything but the pain in his side. But the consumptive is well 'from his neck up.' He has time to think about everything, has time to worry about everything, and he has time to do about everything—foolish and detrimental. He must, therefore, be instructed, trained, educated." (*M. E. C.*)

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Importance of Mental Hygiene.—"Our chief problems are not intellectual but instinctive and emotional. The deepest conflicts in life are not primarily of intellect with physical environment but of impulse and desire with a complex civilization which imposes all kinds of restrictions and inhibitions upon individual expression. If this be true, no school is really educating the children as long as it deals only with the intellectual and physical life and ignores the great body of instinctive and emotional needs which are growing up along with the intellectual; more fundamental in every way, and left chiefly to chance influences for guidance. It is on this basis, the needs of every child, normal or neurotic, that we have the right to urge mental hygiene in the public schools."—Jessie Taft, Ph.D., *N. Y. State Jour. Med.* (*M. E. C.*)

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Publicity.—"In charitable matters, 'Let not your right hand know what your left hand doeth' is good advice for the individual; but, for a public institution, a better motto would be, 'Do all the good you can, to all the people you can, and let as many as possible know it.' Letting as many as possible know it is publicity."—Frederick D. Greene, in *The Modern Hospital.*

(*M. E. C.*)

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The Children and the Public Health Movement.—That children can aid in the public health movement is emphasized by the organization called the Modern Health Crusaders, which was started a year ago in connection with the Red Cross Christmas Seal Campaign. One hundred thousand children are now enrolled. As a requisite for membership the child must have done a series of "Health Chores." The following are the chores:—

1. I washed my hands before each meal today.

2. I drank a glass of water before each meal and before going to bed today.

3. I brushed my teeth in the morning and in the evening today.

4. I took ten or more slow deep breaths of fresh air today.

5. I played outdoors or with the windows open more than thirty minutes today.

6. I was in bed ten hours or more last night and kept my window open.

7. I tried today to sit up and stand up straight, to eat slowly, and to attend to toilet and each need of my body at its regular time.

8. I took a full bath on each day of the week that is checked (x). (*M. E. C.*)

*

The Control of Communicable Diseases.—*Public Health Reports* for October 12, 1917, prints the report of the American Public Health Association Committee on Standard Regulations Regarding the Control of Communicable Diseases. The diseases considered are those recommended in the Model State Law for Morbidity Reports and are 38 in number.

The report first defines certain terms, as cleaning, contact, disinfection, fumigation, isolation, quarantine, etc., and then proceeds to treat the 38 diseases under the following heads: Infective agent, source of infection, mode of transmission, incubation period, period of communicability, methods of control, including recognition of the disease, isolation, immunization, quarantine, concurrent disinfection, terminal disinfection, and certain general measures. (*M. P. H.*)

*

The War and Consumption in the Civil Population.—Harold Kerr, medical officer of health for the City of Newcastle-on-Tyne, analyzes the statistics for his city and reports in the *Medical Officer* for October 27, 1917. He finds that tuberculosis is more prevalent in all the warring countries, than before the war. The causes which are especially likely to render persons most susceptible to contract and to succumb to consumption are poverty, bad and insufficient housing with resulting overcrowding, physical and mental overstrain, employment under unhealthy conditions, constitutional enfeeblement, infection from milk, lowering the vital resistance by overindulgence in alcohol, and lack of proper medical attention. The investigation shows that the increase in pulmonary tuberculosis in Newcastle-on-Tyne, is essentially due to poverty, bad housing and physical and mental overstrain. One interesting point brought out by the study is the large increase in pulmonary tuberculosis among girls from 15 to 20 years of age. These girls have to a large extent replaced the men in industry, who have been called off to the war. (*M. P. H.*)

*

Duration of Contagion in Scarlet Fever.—According to the *Boston Medical and Surgical Journal* for November 29, 1917, scarlet fever is not as contagious as measles or whooping-cough, although it is a more serious disease and has a high mortality. Of those directly exposed to whooping-cough, for instance, about 99 per cent of the contacts come down with the disease, whereas in scarlet fever rarely over 37 per cent of the contacts are taken ill. The disease seems to be spread mostly by contact, usually through droplet infection. It is probable, too, that there are carriers of this disease just as there are for other diseases.

There is still much doubt as to the infectiousness of the desquamatory skin. If it is infectious, probably the first desquamation is more so than the second. The most plausible thing that can be said about desquamation is, that the period of desquamation serves as an index of the period of contagion, rather than the cause of it. In other words, as long as there is desquamation, there are infective discharges from the mucous membranes. The quarantine in ordinary or in uncomplicated cases should last from five to six weeks. (*M. P. H.*)

Industrial Hygiene and Sanitation.

Abstracts prepared by Dr. Emery R. Hayhurst and Dr. R. P. Albaugh

Dope Poisoning in the Manufacture of Airplane Wings. Alice Hamilton, *Monthly Review, U. S. B. L. S.*, October, 1917, pages 18–25. For the most part the only unusual hazards in the making of airplanes is the use of so-called dope to tighten up the linen used on the wings and make it durable and waterproof. At present, the base of dopes used for airplanes is a cellulose compound with nitrate or acetate. While these are free from poisonous properties, their solvents may not be. These harmful solvents are tetrachlorethane, varying quantities of acetone, or other ketones, and methyl alcohol and benzol. The first named may constitute from 20 to 63 per cent of the dope. Poisonings by this substance were almost simultaneously reported in both Germany and England, the chief effect being upon the liver, usually with an acute onset and usually with a production of jaundice, and perhaps a fatal issue. By the beginning of 1917 tetrachlorethane was no longer in use for government work in Great Britain. The substance appears to be four times as toxic as chloroform. It is apt to be used in fireproofing fabrics, films, etc., in addition to the airplane industry. Where cellulose nitrate is used, acetone is the solvent, which, though a poison, is much less harmful. "Banana oil" (amyl acetate) and fusel oil (amyl alcohol) are other solvents, both of which are poisons of varying degree. The nitrate dopes are to be preferred because of the lesser toxic actions of the solvents used.

⁂

Employers' Housing in the United States. Leifur Magnusson, *Monthly Review, U. S. B. L. S.*, November, 1917, pages 35–60, illustrated. This is a summary of a forthcoming report of the bureau. There is considered the company town, the company house and its cost, maintenance, the investment feature and the general aspects of the system. The industries dealt with are principally mining, iron and steel, explosives and textiles.

⁂

Hours of Labor and Output in British Munition Factories. Memorandum No. 18. H. M. Vernon. Reviewed by *Monthly Review, U. S. B. L. S.*, November, 1917, pages 61–62. The author states that these investigations are, perhaps, too limited in the types of labor investigated to permit of final deductions. A number of interesting conclusions substantiate the contentions that a certain amount of reduction of hours in some industries has resulted in both a relative and absolute increase in hourly and daily production.

⁂

Annual Report, Massachusetts State Board of Labor and Industries, January, 1917, 197 pages. In this document the report of the Deputy Commissioner (medical) contains considerable matter of importance, particularly under the headings of dust and fume removal while some space is given to explosives, and occupational diseases, where anthrax, brass poisoning, benzol poisoning, caisson disease and lead poisoning are discussed as they have fallen within the experience of the department. Various other industrial poisons are also included, while under the appendices are to be noted the special investigations in the cutlery, hat and tobacco industries, in pattern shops and department store basements. Reports of this type are very valuable in that they give actual experiences, and from as impartial a viewpoint as possible.

⁂

Investigations of Tobacco Workers. Grier Miller, *Monthly Bulletin, Pennsylvania Department of Labor and Industry*, June, 1917, pages 7–17. Miller was unable to note any peculiar influences of the trade upon menstruation in working women of whom 302 were studied. There appeared to be an unusually low birth-rate. Chief among physical findings were conjunctival congestion, wearing of teeth and pharyngeal congestion. The effect on the teeth is probably due to the biting off of the ends of cigars. Constipation was the most frequent diagnosis. Dust determinations showed averages of 3,500 particles per cubic foot in the banding rooms to 235,000 in stock rooms. At no time were temperatures below 75° F. found; ventilation was generally poor, although the light was fairly good throughout.

Wound Infections Among Lathe Workers. Marvin D. Shie, *Journal A. M. A.*, December 8, 1917, pages 1927–1930. This very common and troublesome affliction, represented by boils and furunculosis, has been carefully studied by Shie in a plant employing 2,000 men at Cleveland. Lathe workers were almost the only ones affected and a careful bacteriological study of the cutting mixture and the oil used soon located the trouble in the former principally. Multiple small cuts from flying chips of steel on the hands and arms of the workers offer abundant portals of entry for pyogenic organisms. An interesting method of proving this was through the application of the electric magnet which came away covered with fine steel hairs and splinters pulled out of the skin. Under prevention, Shie mentions heat or chemical disinfection. He experimented with the latter and came to the conclusion that a 5 per cent solution of cresol was the most effective. He did not try heat because it was not available. (Investigations of this subject have rather convinced me that heat in the form of pasteurization is the most practical and efficient method of rendering these cutting fluids harmless and, furthermore, does not lay the workers liable to a cresol dermatitis which is a fairly frequent cause of complaint among workers subjected to this substance.—R. P. Albaugh.)

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Quantitative Determination of Air Dust. E. Vernon Hill, *Heating and Ventilating Magazine*, June, 1917. (Doctor Hill, who is Chief of the Division of Ventilation, Department of Health, Chicago, demonstrated his new dust counter before the Section on Industrial Hygiene at the Washington meeting where its uniqueness and apparent practicalness created considerable interest.)

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Are You Sick? *National Safety Council, Chicago, Bulletin Board Series No. 533.* This poster for display to workmen calls particular attention to personal hygiene.

*

Effect of Anilin in Rabbits. Mary Wilmarth Brown, Memorial Institute for Infectious Diseases, Chicago. *Journal of Infectious Diseases*, November, 1917, pages 497–501. Anilin, which is an industrial poison of growing importance, was found to attack especially the red cells of the blood, to have no effect on the white cells and to cause areas of focal necrosis in the liver. Effects were somewhat less marked in guinea-pigs and the author states that no direct conclusions should be drawn from these experiments as to its effects on man.

*

Recent Physiology and the War. Address before the Royal Institute of Great Britain, Charles S. Sherrington, *Science*, November 23, 1917, pages 502–504. Fatigue in relation to working hours; the influence of alcohol on the workers' output, upon voluntary movements and upon precision; and the counteraction of the effect of severe losses of blood in the wounded by the devising of a proper substitute fluid, were the subjects most successfully attacked.

*

Physical Efficiency and Mental Deficiency. E. H. Ingram, *Safety Engineering*, October, 1917. Doctor Ingram, who is plant physician, emphasizes the great importance of the mental test in physical examinations. Such would prevent many "fool" accidents such as men striking matches to see if a gasoline tank was full—when it was; thrusting fingers into holes to see if drills were running—when they were; unbolting scaffolds upon which they themselves were standing. The author cites instances of his own experience where pupils upon leaving a special orthogenic class in the public schools at Philadelphia found work driving vehicles and the like. He describes one or two simple tests for detecting the mentally deficient.

*

Resuscitation from Gas Asphyxiation, Drowning and Electric Shock. Yandell Henderson. An illustrated poster for instructing workmen, published by the *U. S. Bureau of Mines*, Washington, D. C.

*

Low Voltage Hazards. C. A. Lauffer, *Safety Engineering*, November, 1917. In this excellent paper Doctor Lauffer discusses practically every hazard known to electricity from both the accident and health standpoints. Under the latter are discussed "flashed eyes," "flashed skin," inhalation of fumes from burned insulation, resuscitation from electric shock, the hazard of dust and dirt and the like.

Public Health Laboratory Notes.

Abstracted by Dr. Arthur Lederer.

BACTERIOLOGY.

Three Per Cent Lactose Litmus Agar Plate for B. Coli in Water Examinations.—Lactose litmus agar plates prepared with 3 per cent. agar and inoculated by streaking on to the surface restrict entirely any spreading forms, and give results approximately equivalent to Endo's medium plates. Endo's medium, however, gives slightly higher results.—E. M. Meyer, *Jour. Bact., 2, 237.*

⁂

Bruck's Serochemical Test for Syphilis.—Nitric acid when added to syphilitic blood serum causes a precipitate to form. Bruck's technique is based on an acid containing per hundred grams, 24.77 grams of nitric acid, or, per 100 cc., 28.48 cc. of nitric acid with a specific gravity of 1.149. He uses 0.3 cc. To 0.5 cc. of clear serum 2 cc. of distilled water are added. This is shaken, and then 0.3 cc. of nitric acid is added with a standardized pipette. This is shaken and permitted to stand at room temperature for ten minutes. Then 16 cc. of distilled water at 15° C. are added and shaken slowly three or four times so as not to foam. This shaking is repeated ten minutes later, and then the tube is set aside for half an hour. If the serum is syphilitic, it shows a distinct flocculent turbidity. In twelve hours a precipitate is piled up on the floor of the test tube. If the serum is non-syphilitic, there is no precipitate at any time.—Anon, *München. med. Wchnschr., Jan. 2, 1917, p. 25.—Jour. Amer. Med. Assn., 69, 1463.*

⁂

Preservation of Antisheep Hemolytic Amboceptor.—Fresh antisheep hemolytic amboceptors that were heated to 55° C. for half an hour, and then mixed with an equal volume of glycerol did not deteriorate, but retained their original titre for three years. During that period anticomplementary properties did not develop. The glycerol did not influence the complement fixation reaction.—O. Clock and S. D. Beard, *Jour. Infect. Dis., Oct., 1917, p. 404.—Jour. Am. Med. Assn., 69, 1380.*

⁂

The Fallacy of Refined Readings of Gas Percentages in the Fermentation of Lactose Peptone Bile and Lactose Broth.—Since there are so many factors such as temperature, time of incubation, length of inverted vial, source of bile, etc., which play an important part in the final gas readings, and since no real quantitative value can be assigned to any observation of gas production, it seems that refined readings of gas percentages have no scientific justification in sanitary bacteriologic analyses and that gas production could be recorded more scientifically by plus or minus signs respectively.—William W. Browne and B. Ackman, *Jour. Bact., 2, 249.*

⁂

Isolation of Typhoid Bacilli from Urine.—To isolate typhoid bacilli from urine not collected under aseptic precautions, streak two or three large loops of the urine over the surface of an Endo plate or eosin brilliant-green plate; add to the urine approximately one-half its volume of nutrient broth and incubate the mixture over night. If the plate inoculated with the urine directly is negative the following morning, prepare dilutions of the incubated mixture and streak them again. This will furnish a considerable higher percentage of positive results.—Kan-ichiro Morishama and Oscar Teague., *Jour. Bact., 2, 145.*

⁂

The Cultivation of the Malarial Parasite in Vitro.—A culture medium consisting of normal saline plus 1.5 per cent. sodium citrate and 5 per cent. dextrose was used for the cultivation of the plasmodium. In about 50 per cent. of the cultures there was evidence of increase in the number of parasites. The successful results obtained by Bass with the use of undiluted human serum plus 0.5 per cent. dextrose were confirmed.—L. S. Dudgeon and Cecil Clarke, *Lancet, 192, 530; Abstr. Bact., 1, 222.*

⁂

A Comparative Study of Thick and Thin Blood Smears for Diagnosis of Malarial Fevers.—The thick preparation is preferable since the time required for the diagnosis is greatly reduced and the percentage of positive findings is increased.—H. A. Taylor, *Jour. Am. Med. Assn., 68, 771; Abstr. Bact., 1, 223.*

Specifications and Directions for Testing Milk and Cream for Butter Fat.—This is the report of the Chairman of the Official Dairy Instructors Association's Committee on Official Methods of Testing Milk and Cream for Butter Fat. Specifications for Babcock milk and cream bottles and for pipettes, acid measure scales, weights, etc., are given. Details for carrying out the official Babcock method for milk and three methods for cream, together with precautions and proper manner of sampling are indicated. —O. F. Hunziker, *Jour. Dairy Sc., 1, 38; Chem. Abstr., 11, 2511.*

◆

A Substitute for Litmus in Milk Cultures.—The color changes which occur in litmus-milk cultures may be due to changes in the H-ion concentration of the medium or to reduction or even destruction of the dye. If only an indication of acid or alkali fermentation is wanted, it is advisable to use an indicator which is only affected by a change in the H-ion concentration. Dibromo-o-cresolsulfone-phthalein or for short bromcresol purple fulfills this condition. The comparative value of litmus and bromcresol purple was tested with a variety of organisms. In many instances litmus was rendered useless by reduction or destruction while bromcresol purple acted as a true indicator.—Wm. Mansfield Clark and Herbert A. Subs, *Jour. Agr. Research, 10, 105.*

◆

Procedure for Staining the Polar Granulations of the Diphtheria Bacillus.—Fix the film with absolute alcohol and stain for about five minutes with phenol crystal violet. Rinse with running water and counter stain with 1–500 vesuvin until the film has changed from a violet color to brown; this requires one or two minutes. Wash in running water and dry. The polar granulations are very dark violet standing out against the yellow back-ground of the bacilli.

The following formula is recommended for making phenol crystal violet:

Crystal violet..................	1 gram
Absolute phenol (crystals).......	$2\,^5/_{10}$ grams
Absolute alcohol...............	10 c.c.
Distilled Water................	90 c.c.

Grind up in a mortar and permit to stand for some minutes. Add gradually to the alcoholic solution with constant trituration.—L. Tribondeau and J. Dubrenil, *Compt. rend. Soc. de biol. Par., 80, 331; Abstr. Bact., 1, 302.*

◆

New Anaerobic Methods.—Anaerobic methods dependent upon the catalytic action of platinized asbestos upon hydrogen and oxygen are described. The methods are simple, rapid, clean, and efficient and are applicable to test tubes, Blake bottles flasks, and large containers. —Wilson G. Smillie, *Jour. Exper. Med. Balt., 26, 59; Abstr. Bact., 1, 395.*

◆

A Viable Ten-Year-Old Culture of Bacillus Paratyphosus Beta.—The author reports a culture of B. paratyphosus B. which had been among stock cultures in a sealed test tube for ten years. The viable organism was recovered, and upon the fifth transfer, showed a characteristic reaction on the Russell double sugar medium. The culture had been in the dark and exposed to fluctuating temperature during summer and winter.—M. W. Lyon, *Science, N. Y. & Lancaster, 45, 408; Abstr. Bact.*, 1, 299.

◆

Simple Procedures for Culturing the Cerebro-Spinal Fluid in Cerebro-Spinal Meningitis.—The cerebro-spinal fluid, uncentrifuged, is pipetted into a Petri dish, containing ascetic fluid agar. The dish is placed immediately into an incubator at 37 C. and remains there for about six hours. At the end of this time one side of the Petri dish is raised so that the fluid will leave about one-half the agar surface uncovered. Within about sixteen to eighteen hours after planting, beautiful colonies of meningococci are seen at the edge of the fluid, often making a line at the border. In lieu of the Petri dish, one may use an agar slant, but the amount of surface in the tube is usually insufficient. When the sediment in a centrifuge tube is used it is preferable to add two or three c.c. of ordinary bouillon, shake up the sediment and incubate at 37 C. for about sixteen hours. At the end of this time it is not rare to find the supernatant fluid cloudy, but if it should be clear and appear steril, a fine pipette used to aspirate a little of the purulent sediment will frequently show numerous meningococci, even though the fluid, at the time of puncture, gave a negative result. This procedure is less certain than the preceding, but it is very simple.—L.

Tribondeau, *Compt. rend. Soc. de biol., Par., 80, 328; Abstr. Bact., 1, 300.*

⁂

The Determination of Bacteria in Ice Cream.—The method of collecting samples and making bacterial counts used in the authors' experiments, gives results which indicate that bacteria in commercial ice cream are distributed quite evenly and that an analysis of one sample from a gallon of ice cream gives results which will hold for any other sample from the same gallon. Storage did not seem to cause an uneven distribution of bacteria. Among duplicate plates a variation as high as 41 per cent was observed.—S. Henry Ayers and W. T. Johnson, Jr., *U. S. Dept. Agric. Bull., 563; Abstr. Bact., 1, 311.*

⁂

Glycerin and Antiseptics.—Experimental results show that the presence of glycerin, more or less completely destroys the antiseptic power of thymol, phenol, boric and mercuric chloride, etc., in aqueous solution.—H. P. Goodrich, *Brit. Med. Jour., London, 1917, No. 2942, 647; Abstr. Bact., 1, 325.*

⁂

Skin Diphtheria.—At Richmond, Virginia, during 1916 skin lesions that were at all suggestive of diphtheritic infection, were swabbed and cultures made. There was also wholesale swabbing of sores of all sorts. Out of 191 swabs examined, 34 were positive for diphtheria. Pure cultures were isolated in 11 cases. Virulence tests in 7 cases, were positive.—*Annual Rep., Richmond, Va., Health Dept., 1916.*

⁂

Laboratory Course for War Service.—The New York University and the Bureau of Laboratories of the Department of Health of the City of New York, jointly offer a course in medical laboratory work to applicants who have the preliminary training in science and scientific methods, obtained in a four year college course or the equivalent. The object is to fit workers for war service in medical laboratories in this country and in Europe. The course will extend over a period of three months, requiring six hours' work each day. Application may be made to Dr. Anna W. Williams, Research Laboratory, Foot of East Sixteenth Street. The fee is $75.—*Jour. Am. Med. Assn., 59, 1809.*

⁂

Wassermann Reaction with Old Glycerolated Human Serum.—Ruediger has found that pure glycerol is an ideal preservative for human serum intended for the Wassermann reaction. In order to prevent the serum from becoming anticomplementary, it must be heated to about 56 C. for 30 minutes and then be mixed with an equal volume of glycerol. Serum kept for more than a year, gave practically the same results as when fresh and without preservative.—E. H. Ruediger, *Jour. Infect. Dis., 21, 502*; *Jour. Am. Med. Assn., 59, 1828.*

⁂

Complement Fixation in Acute Poliomyelitis.—The specific antigen for complement fixation in poliomyelitis has been obtained by digesting poliomyelitic virus with trypsin. A 5 per cent suspension of brain and cord of monkeys that have died of poliomyelitis, is filtered through a Berkefeld filter, sterile water being used, as the Menstruum. The trypsin is added in proportion of 1 to 50, and permitted to act at room temperature for three hours; 0.4 per cent tricresol is then added to stop further action by the trypsin.—M. Neustaedter and E. J. Banzhaf, *Jour. Infect. Dis., 21, 515.*

⁂

APPARATUS AND TECHNIQUE.

A New Ice Sampler.—This new ice sampler is based on the principle of a coal sampler. With this apparatus it is possible to get a representative sample without contamination.—Myrtle Greenfield, *Jour. Bact., 1, 623 (1917).*

⁂

A Device for Accurate Pipetting.—An apparatus is described which removes the disagreeable task of pipetting syphilitic serum, typhoid cultures, chemicals and the like by means of the mouth method.—Leonard R. Thompson, *Jour. Lab. and Clin. Med., 3, 130.*

⁂

Water-Proofing Labels.—Labels may be water-proofed by first "sizing" them with a thin solution of acacia in water. This is applied by means of a pledget of cotton or a fine brush and permitted to dry. A coat of celluloid dissolved in acetone or shellac dissolved in alcohol is afterward applied.

The following formula and process may be used to advantage:

(A)	Gelatine	100 parts
	Acetic acid (36%)	300 parts

	Glycerin	10 parts
(B)	Potassium dichromate	20 parts
	Water	200 parts

For use equal parts of A and B are mixed just prior to being applied. The coated label is then exposed to the light until dry. If the yellow color of the coating is undesirable, a solution of formaldehyde may be used instead of B.—*The Druggist's Circular, 61, 579.*

⁂

Comparative Tests of Chemical Glassware.—The cutting off of imports from Germany and Austria has forced us to rely upon American manufacturers for practically our entire supply of glass beakers and flasks. In order to give chemists some information as to the quality of this ware, the Bureau of Standards has examined five brands of American-made ware in comparison with the two best known wares of European make. The results indicate that all the American-made ware tested are superior to Kavalier and equal or superior to Jena ware for general chemical laboratory use.—P. H. Walker and F. W. Smither, *Jour. Ind. Eng. Chem., Dec. 1, 1917, p. 1090.*

⁂

A New Test Paper.—A very delicate test paper has been prepared in Japan from the fruit of the Tama-tsubaki which has a violet color and is turned to greenish blue by a mere trace of alkali and to red by an extremely dilute acid solution. The plant is also known in Japan as Nezumimochi or Teratsubaki. The inventor noticed that the color of its fruits never fade while the color of the flowers quickly fade. He squeezed the fruit and dyed a filter paper with the juice which gave a violet shade.—"*M*" *Jour. Ind. Eng. Chem., Dec. 1, 1917, p. 1144.*

⁂

CHEMISTRY

P-Nitrophenol as an Indicator in Water Analysis.—Although methyl-orange and p-nitrophenol are equally sensitive as indicators in estimating the acidity of natural waters, the color change of p-nitrophenol renders its use more suitable in the case of turbid waters. p-Nitrophenol is not altered by boiling with water under pressure.—A. Goldberg, *Chem. Ztg., 1917, 41, 5929; Jour. Chem. Soc. London, Oct., 1917, p. 498.*

⁂

Soluble Starch Solution.—The addition of a very small quantity of an alkali, for example, sodium hydroxide, prevents the bacterial decomposition of starch solutions; the quantity of alkali necessary is too small to have any influence when the starch solution is used as an indicator in iodometric titrations.—Pollitz, *Ztschr. f. angew. Chem., 1917, 30, 1, 132; Jour. Chem. Soc. London, Oct., 1917, p. 499.*

⁂

Estimation of Dissolved Oxygen in Water in the Presence of Nitrites and Organic Substances.—Nitrites may be destroyed previously to the estimation of dissolved oxygen by treating the water with 1 cc. of 50 per cent carbamide solution and 1 cc. of 25 per cent sulfuric acid, and allowing the action to proceed for four hours. In the opinion of the author, Rideal and Stewart's method is also trustworthy.—H. Noll, *Ztschr. f. angew. Chem., 1917, 30, 1, 105; Jour. Chem. Soc. London, Oct., 1917, p. 502.*

⁂

Separation and Identification of Food Coloring Substances.—A detailed scheme of analysis is described, embracing 130 chemical compounds which comprise practically all the coal-tar colors mentioned in the literature as suitable for having been found in foods. The method for the separation of colors depends principally on the use of immiscable solvents. For the identification of the dyes after isolation their behavior in the dry form and when dyed on fibres with the usual reagents is given in tabular form. Space is also given to the consideration of natural coloring substances.—W. E. Mathewson, *U. S. Dept. Agr. Bull. 448* (*1917*).

⁂

Amyl Alcohol in the Determination of Milk Fat.—The Gerber method for the determination of fat in milk usually yields higher results than the Babcock method, the error being greater the higher the fat content of the milk. Only amyl alcohol of standard purity should be used.—Orla-Jansen, *Maelkeritid, 29, 104* (*1916*); *Expt. Stat. Record, 36, 507.*

LIST OF MEMBERS.

AMERICAN PUBLIC HEALTH ASSOCIATION.

January 1, 1918.

(*L*) Indicates members of Laboratory Section.
(*P*) Indicates members of Public Health Administration Section.
(*E*) Indicates members of Sanitary Engineering Section.
(*V*) Indicates members of Vital Statistics Section.
(*I*) Indicates members of Industrial Hygiene Section.
(*S*) Indicates members of Sociological Section.
(*F*) Indicates members of Food and Drug Section.
(*) Indicates "Engaged in war service on January 1, 1918."

NOTE.

This list is complete only in so far as we have been notified.

Admission to membership in sections is by election, except in the case of the Public Health Administration Section. Here simple registration with the Section Secretary at an annual meeting suffices.

MEMBERS.

Abele, C. A. (*F*)	c/o Red Cross San. Unit. No. 8. Calhoun County, Conn. House, Anniston, Ala.	1917
Abercombie, T. F., M. D. (*V*, *E*)	State Board of Health, Atlanta, Ga.	1914
Aberthnay, Wm. Green, M. D.	Woodland, Miss.	1914
Abshire, J. T., A. M., M. D.	Le Roy, La.	1917
Abt, Isaac Arthur, M. D.	4810 Kenwood Ave., Chicago, Ill.	1916
Adams, F., M. D.	497 Brunswick Ave., Toronto, Ont.	1914
Adams, George O.	Experiment Station, Lawrence, Mass.	1915
Adams, Samuel Hopkins	Ensenore, N. Y.	1915
Adamson, Elizabeth Ingram, M. D.	Canal St., Ft. Plain, N. Y.	1917
Agramonte, Aristides, M. D.	K St. 146–148 Vedado, Habana, Cuba	1915
Aikman, Wm. H., M. D. (*F*)	609 Main St., Natchez, Miss.	1916
Albaugh, Roscoe Porter, M. D.	State Department of Health, Columbus, Ohio	1918
Akerley, A. W., M. D.	73 Gainsborough St., Boston, Mass.	1917
~~Albert, Henry, M. D. (*L*, *P*)~~	221 South Lucas St., Iowa City, Iowa	1907
Alden, A. M. (*L*)	Santo Tomas Hospital, Ancon, C. Z.	1913
Allen, A. F. (*E*)	United States Public Health Service, Campello, Mass.	1913
Allen, Kenneth (*E*)	Engineer Sewage Disposal Board of Estimate, Municipal Bldg., New York City	1915
Allen, L. C., M. D. (*S*)	Hoschton, Ga.	1914
Allen, Robert McDowell (*F*)	East 143d St. and South Boulevard, New York City	1917
Allison, Wm. F., C. E.	5264 19th Ave., N. E., Seattle, Wash.	1916
Alsberg, Dr. Carl L. (*F*, *L*)	Chief Bureau of Chemistry, U. S. Dept. of Agriculture Washington, D. C.	1913
Alvord, John W. (*E*)	127 Hartford Bldg., Chicago, Ill.	1899
~~American Tel. & Tel. Co.~~	15 Dey St., New York City	1915
Amerman, Bessie Ely	185 Liberty St., Bloomfield, N. J.	1916
Amerman, H. V.	Town Hall, Kearny, N. J.	1917
Amoss, Harold L., M. D. (*L*)	Rockefeller Institute, New York City	1911
Amyot, John A., M. D. (*L*, *E*)	*Address unknown*	1900
~~Anderson, John B., M. D.~~	Health Officer, Spokane, Wash.	1912
~~Anderson, John F., M. D. (*L*)~~	c/o E. R. Squibb & Sons, New Brunswick, N. J.	1903
Andrews, James Lindsay, M. D.	Goodwyn Institute Bldg., Memphis, Tenn.	1917
Andrews. John B., M. D.	131 East 23d St., New York City	1913
Apfelbach, George L., M. D.	25 East Washington St., Chicago, Ill.	1916
App, John C.	1008 Quarrier St., Charleston, W. Va.	1916
Appel, Edwin J. (*F*)	Health Bureau, Rochester, N. Y.	1916
Arhcibald, Robert A., M. D.	1724 Webster St., Oakland, Cal.	1910
Arkin, Prof. Aaron	West Virginia Univ., Morgantown, W. Va.	1914
Armagnac, Arthur S.	1123 Broadway, New York City	1915
Arment, Samuel B., M.D. (*F*)	25 West 5th St., Bloomsburg, Pa.	1901
~~Arms, B. L.~~, M. D. (*L*, *F*, *P*, *S*)	Fla. State Bd. of Health, Jacksonville, Fla.	1906
Armstrong, Donald, B., M. D. (*L*, *V*, *S*)	Framingham, Mass.	1913
Arnold, Frank	408 House Bldg., Pittsburgh, Pa.	1913
Ascanio, Ramon, M. D. (*P*)	San Jose Delas Lajas, Havana, Cuba	1911
Ashford, Major Bailey K. (*L*, *S*, *E*)	San Juan, P. R.	1912
Atwell, Floyd J., M. D.	48 Chestnut St., Cooperstown, N. Y.	1915
Atwood, Frank Garwood	158 Whalley Ave., New Haven, Conn.	1914

Auburn City Water Board (*E*)	7 Exchange St., Auburn, N. Y.	1915
Ayer, Ira, M. D.	Medical Advisor, Prov. Public Health Dept., Ministry of the Interior, Bangkok, Siam	1914
Ayres, J. M.	City Health Officer, Bennington, Vt.	1914
Ayres, S. Henry (*L, F*)	Dairy Division, U. S. Dept. of Agriculture, Washington, D.C.	1912
Bachman, Frank	102 Civil Engineering Bldg., Berkeley, Cal.	1915
Bachmeyer, A. C., M. D.	Cincinnati Gen. Hospital, Avondale, Cincinnati, Ohio	1916
Bailey, Wm. J.	802 Twiggs St., Tampa, Fla.	1915
Bailey, Wm. S.	110 East 4th St., Jamestown, N. Y.	1915
Baker, M. N. (*P, S, E*)	R. F. D., Maple Heights, Elizabethtown, N. Y.	1912
Baker, S. Josephine, M. D.	139 Centre St., New York City	1915
Bakeman, G. W.	1022 Chestnut St., Newton Upper Falls, Mass.	1914
Baker, Clarence M. (*P, E*)	189 Kent St., Albany, N. Y.	1914
Baker, John	*Address unknown*	1915
Balch, Alfred W., M. D. (*L*)	c/o Metropolitan Ins. Co., Room 10033, 1 Madison Ave., New York City	1914
Baldwin, Augustus	Lorain, Ohio	1905
Baldwin, Frederick A., M. D. (*L*)	2124 South Grand Ave., St. Louis, Mo.	1914
Baldwin, F. O. (*L, E*)	706 Chamberlayne Ave., Richmond, Va.	1912
Baldwin, Herbert B. (*L, F*)	927 Broad St., Newark, N. J.	1914
Baldwin, Wm. H. (*F, S, V*)	1415 21st St., Washington, D. C.	1910
Ball, C. B. (*P*)	4227 North Ashland Ave., Chicago, Ill.	1910
Ball, H. J., M. D.	1 Bemus Pl., Glens Falls, N. Y.	1915
Ballinger, T. Dudley	37 Park Pl., Orange, N. J.	1913
Bantrell, M. A., C. E. (*L, E*)	418 Melville St., Rochester, N. Y.	1916
Barber, Prof. Marshall A.	Univ. of Kansas, Rosedale, Kan.	1906
Barbour, F. A., C. E. (*E*)	1120 Tremont Bldg., Boston, Mass.	1900
Barnard, Harry Everett, Ph. D. (*I, F*)	Indiana State Bd. of Health, Indianapolis, Ind.	1916
Barnes, A. S., Jr., M. D.	210 Cent. Nat. Bldg., St. Louis, Mo.	1915
Barnes, Henry J., M. D.	429 Beacon St., Boston, Mass.	1896
Barnes, T. H.	1646 Whitehall Bldg., New York City	1910
Barney, S. E.	346 Whitney Ave., New Haven, Conn.	1914
Barr, Frederick G., M. D.	538 Kenwood Ave., Dayton, Ohio	1917
Bartholomew, H. S., M. D. (*P*)	103 Main St., West Lansing, Mich.	1916
Bartlett, Charles J., M. A., M. D. (I)	183 Bishop St., New Haven, Conn.	1917
Bartlett, C. W.	508 Oak Ave., Tampa, Fla.	1914
Bartlett, L. R. (*I*)	Boynton St., Eastport, Me.	1917
Bartlett, Murray, M. D.	357 Gral Luna, Manila, P. I.	1915
Bartow, Prof. Edward (*L. E*)	Univ. of Ill., Urbana, Ill.	1905
Bashore, Harvey B., M. D.	West Fairview, Pa.	1897
Bass, F. H.	515 6th St., S. E., Minneapolis, Minn.	1907
Bassett, Victor H., M. D. (*L*)	City Hall, Savannah, Ga.	1912
Bateman, Prof. Arthur	Sanitary Dept., Am. Schl. of Correspondence, Drexel Ave. and 58th St., Chicago, Ill.	1915
Bates, Carleton (*F, L*)	737 Frederick Ave., Milwaukee, Wis.	1914
Baton, W. U. C. (*L*)	528 South Lang Ave., Pittsburgh, Pa.	1908
Batt, Wilmer R., M. D. (*V*)	2138 North 2d St., Harrisburg, Pa.	1907
Bauman, James E.	O. S. U. Campus, Columbus, Ohio	1916
Baylis, John R.	3402 Harford Ave., Baltimore, Md.	1916
Beach, S. C., M. D.	429 Provident Ave., Winnetka, Ill.	1917
Beagle, Fenimore D.	State Health Dept., Albany, N. Y.	1915
Beard, J. Howard, M. D. (*F, S*)	503 South Race St., Urbana, Ill.	1914
Beard, Prof. R. O.	Univ. of Minnesota, Minneapolis, Minn.	1914
Beatty, T. B., M. D.	Utah State Board of Health, Salt Lake City, Utah	1917
Beck, Joseph C., M. D.	2551 North Clark St., Chicago, Ill.	1916
Beckwith, T. D. (*F, L*)	Agricultural College, Corvallis, Ore.	1911
Bedell, Arthur S.	581 Myrtle St., Albany, N. Y.	1917
Beebe, Lela J., M. D.	4222 Chestnut St., Philadelphia, Pa.	1917
Beebe, W. L., M. D.(*L*)	Lowry Annex, St. Paul, Minn.	1907
Beer, James A., M. D. (*F*)	55 East State St., Columbus, Ohio	1915
Begg, R. B. H. (*P, E*)	Cobham, Va.	1912
Beitler, F. V., M. D. (*V, L*)	Ridge Ave., Hallthrop, Md.	1911
Belau, Laetitia Louisa, M.D. (*F*)	649 Wrightwood Ave., North Halsted Station, Chicago, Ill.	1914
Bell, F. D. (*F, E*)	39 West 38th St., New York City	1907
Bell, Gordon, M. D. (*L*)	Winnipeg, Man.	1899
Bell, R. W. (*L, P*)	350 Davenport Rd., Toronto, Ont.	1908
Bell, W. G.	609 West Main St., Gainesville, Fla.	1914
Benedict, Charles C., M. D.	Anchorage, Alaska	1916
Bennett, A. G., M. D.	Connecticut Ave., Greenwich, Conn.	1914
Bennett, John Hillman, M. D.	306 High St., Pawtucket, R. I.	1917
Bensel, W., M. D. (*P*)	105 West 74th St., New York City	1913
Bentley, D. B., M. D.	*Address unknown*	1915
Bentz, Charles A., M. D.	84 Orange St., Buffalo, N. Y.	1916

Berberich, Norbert M. (*F*)	53 Locust St., Buffalo, N. Y.	1917
Berger, H. E., Jr.	Board of Health, Wellesley, Mass.	1916
Bergey, David H.	206 South 53d St., Philadelphia, Pa.	1915
Bernhagen, Lewis Otto (*F*)	1502 Second Ave., Minneapolis, Minn.	1914
Bernier, Arthur, M. D.	Laval University, St. Denis St., Montreal, Quebec	1914
Berry, Charles White, M. D.	572 47th St., Brooklyn, N. Y.	1914
Besemer, A. M., B. S. (*L, F*)	324 College Ave., Ithaca, N. Y.	1915
Beyer, H. G., M. D. (*L*)	The Marlborough, Washington, D. C.	1910
Bierring, Walter L., M. D. (*P*)	Equitable Bldg., Des Moines, Ia.	1913
Bigelow, W. D., M. D. (*F*)	1739 H St., N. W., Washington, D. C.	1914
Biggs, Hermann M., M. D. (*P*)	39 West 56th St., New York City	1913
Billings, F. H. (*L*)	540 Alvarado St., Redlands, Cal.	1912
Billings, J. S., M. D. (*L*)	Douglaston, Long Island, N. Y.	1905
Bingham, Don W. (*E*)	Ass't Engr., State Board of Health, Lansing, Mich.	1914
Bird, U. S., M. D.	P. O. Box 792, Tampa, Fla.	1914
Birdsall, Lewis I. (*L, E*)	Supt. Filtration, St. Anthony Falls Sta., Minneapolis, Minn.	1912
Birge, E. G., M. D. (*L*)	State Health Lab., Jacksonville, Fla.	1907
Bishop, Robert H., Jr., M. D.	2523 Euclid Ave., Cleveland, Ohio	1912
Bissell, Wm. G., M. D. (*L*)	Bur. of Lab., 484 William St., Buffalo, N. Y.	1914
Bize, L. A., M. D.	Box 77, Tampa, Fla.	1914
Black, J. T., M. D. (*P*)	285 Montauk Ave., New London, Conn.	1914
Blair, Frank A.	2835 Sheffield Ave., Chicago, Ill.	1917
Blanck, F. C., M. D. (*F, L*)	Bureau of Chemistry, U. S. Dept. of Agriculture, Washington, D. C.	1911
Blauvelt, A., M. D.	338 West 12th St., New York City	1917
Blaylock, George A., M. D.	Perryville, Mo.	1916
Blue, Rupert, M. D. (*P*)	3 B St., Washington, D. C.	1912
Boardman, W. H.	426 Walnut St., Philadelphia, Pa.	1914
Bolduan, C. F., M. D. (*L, E, V*)	139 Center St., New York City	1912
Bolling, George E. (*L, P*)	City Hall, Brockton, Mass.	1900
Bolten, Joseph S., M. D.	Hygienic Lab., 25th and E Sts., N. W., Washington, D. C.	1916
Bonnet, Frederic, Jr. (*L*)	22 Dayton St., Worcester, Mass.	1913
Bonnier, Jos. Wilfrid, M. D.	Department Public Health, 9 St. James St., Montreal, Quebec	1917
Booker, Warren H. (*F*)	State Health Board, Raleigh, N. C.	1912
Booth, John T., M. D.	1110 Capitol St., Richmond, Va.	1915
Boswell, Henry, M. D.	Magee, Miss.	1916
Bosworth, Robinson, M. D.	824 Lowry Bldg., St. Paul, Minn.	1914
Boteler, George McCrary	825½ Frederick Ave., St. Joseph, Mo.	1914
Botsford, C. P., M. D.	219 Collins St., Hartford, Conn.	1911
Boucher, S., M. D. (*P*)	412 Rue St. Denis, Montreal, Quebec	1914
Boudreau, Frank G., M. D. (*V*)	2503 Summit St., Columbus, Ohio	1916
Bouton, Otis Z., M. D. (*P*)	Main St., Fultonville, N. Y.	1915
Bow, Malcolm R., M. D. (*F*)	2136 Argyle St., Regina, Sas.	1915
Bowen, D. C.	707 Fourth Ave., Asbury Park, N. J.	1915
Bower, Chas. H., M. D.	Council Bluffs, Iowa	1917
Bowles, Major J. T. B. (*L, E*)	c/o Surgeon General, U. S. A., Washington, D. C.	1907
Bowman, Herbert E., Ph. G. (*F*)	186 Central St., Somerville, Mass.	1917
Bowman, Waldo M., M. D. (*F*)	319 Superior St., Toledo, Ohio	1915
Bowman, Wm. F.	East Orange, N. J.	1915
Boycheff, G. T., M. D.	1107 Milton Ave., Solvay, N. Y.	1915
Boyd, Hiram, M. D.	State Board of Health, Jacksonville, Fla.	1917
Boyd, Mark F., M. D. (*L*)	Medical Dept., Univ. of Tex., Galveston, Tex.	1913
Boynton, Clarence N., M.A.	Box 1328, Phoenix, Ariz.	1916
Boynton, Perkins (*E*)	329 West 9th St., Chester, Pa.	1016
Bradford, G. D., M. D. (*P*)	Cayuga St., Homer, N. Y.	1915
Bransfield, P. E. (*L*)	18 Marlborough St., Portland, Conn.	1914
Braunnagel, Julius, M. D.	Box 925, San Antonio, Tex.	1890
Bray, Prof. W. J. (*F*)	702 East Normal Ave., Kirksville, Mo.	1915
Breed, Robt. S. (*F, L*)	N. Y. Exper. Station, Geneva, N. Y.	1909
Brem, Walter V., M. D.	932 Maltman Ave., Los Angeles, Cal.	1915
Bresth, Alexander	West Acton, Mass.	1916
Brewer, Isaac W., M. D. (*F*)	Fort Ethan Allen, Vt.	1915
Brewster, J. H. (*E*)	State Dept. of Health, Albany, N. Y.	1917
Bridge, Norman, M. D., A. M. (*S*)	718 West Adams St., Los Angeles, Cal.	1915
Briggs, A. B., M. D.	Ashaway, R. I.	1915
Briggs, Edward F., M. D. (*P*)	Bedford Hills, N. Y.	1915
Bristol, L. D., M. D. (*L*)	State Dept. of Health, Augusta, Me.	1914
Brito, A. Dias, M. D.	Military Surgeon, Calle 17 No. 8, Habana, Cuba	1917
Bronfenbrenner, J., Ph. D. (*F, I*)	Harvard Medical School, Boston, Mass.	1917
Brook, Jacob D., M. D.	191 East St., Grandville, Mich.	1916
Brooks, James E.	6 Wildwood Terrace, Glen Ridge, N. J.	1912
Brooks, Paul B.	State Dept. of Health, Albany, N. Y.	1915
Brown, Arthur A., M. D.	80 Humphrey St., Swampscott, Mass.	1916
Brown, Benj. W., M. D.,	Surgeon U. S. P. H. S., 612 Commercial Bank Bldg., Charlotte, N. C.	1917

Brown, Claude P., M. D. Captain M. O. R. C., 1501 Park Rd., N. W., Washington, D. C. 1912
Brown, E. W., M. D. .... U. S. S. Bushnell, c/o Postmaster, New York City 1914
Brown, H. A., M. D .... 306 4th St.. S. E., Washington, D. C. 1913
Brown, Henry Seabury, M. D. .... 413 Friendship St., Providence, R. I. 1916
Brown, Hugo A. (*S*) .... 175 East Swan St., Buffalo, N. Y. 1915
Brown, James R. .... 47 West 42d St., New York City 1915
Brown, Lawrason, M. D. .... 104 Main St., Saranac Lake, N. Y. 1915
Brown, Lucius P. (*L, F*) .... 137 Davis Ave., West New Brighton, L. I., New York City 1915
Brown, Robert H. (*L, E*) .... 21 West 127th St., New York City 1907
Brown, Walter E. .... 357 West Duval St., Germantown, Philadelphia, Pa. 1915
Brown, Walter H., M. D. .... 280 Glenwood Ave., Bridgeport, Conn. 1915
Brown, W. E. .... Harvard Medical School, Boston, Mass. 1915
Browne, James Alexander, M. D. .... 364 Van Houten St., Paterson, N. J. 1914
Browne, W. W., M. D. (*F, L, E*), Coll. of the City of New York, 139th St., New York City 1911
Brumfield, W. A., M. D. .... 1110 Barton Ave., Richmond, Va. 1915
Brundage, N. E., M. D. .... Delphos, Ohio 1916
Brunner, Wm. F., M. D. (*P*) .... City Hall, Savannah, Ga. 1914
Bryce, Peter H., M. D. (*F, E, V*) .... Dept. of Interior, Ottawa, Ont. 1883
Buck, Carl E. (*F*) .... Dept. of Health, Oak Park, Ill. 1916
Buckland, Thomas (*L, P*) .... 9 Munic. Ct. Bldg., St. Louis, Mo. 1910
Bull, Irving C. (*L*) .... 100 Maiden Lane, New York City 1912
Bulla, A. C. .... Winston-Salem, N. C. 1917
Bullock, W. O., M. D. .... 200 Market St., Lexington, Ky.
Bundesen, Herman N., M. D .... 7414 Oglesby Ave., Chicago, Ill. 1917
Bunker, John W. M., M. D. (*L, E*) .... c/o Digestive Ferments Co., 20 Locust St., Detroit, Mich. 1911
Burnett, Clough T., M. D. (*L*) .... 302 Mercantile Bank Bldg., Boulder, Colo. 1913
Burns, Harry B., M. D. (*F, P*) .... Director, Dept. of Hygiene, Pittsburgh Public Schools, Pittsburgh, Pa. 1915
Burns, Richard G., M. D. (*P*) .... 8 Dunlap Ave., Pittsburgh, Pa. 1915
Burr, Daniel S. (*P*) .... 143 Court St., Binghampton, N. Y. 1915
Burrage, Prof. Severance (*L, V*) .... Mass. Inst. Technology, Cambridge, Mass. 1915
Burrell, Norma .... 41 Women's Bldg., East Lansing, Mich. 1917
Burton, Lawrence V. (*L*) .... 4017 Lake Park Ave., Chicago, Ill. 1914
Buswell, A. M. (*F, L, E*) .... Columbia University, New York City 1914
Butler, George F., A. M., M. D. .... Attica, Ind. 1916
Butler & Ellis, Drs .... Shreveport Sanitarium, Shreveport, La. 1917
Butterfield, C. T. .... U. S. P. H. S., Cincinnati, Ohio 1916
Buttles, E. H., M. D.. (*L*) .... Burlington, Vt. 1912
Butz, J. Treichler, M. D. .... 304 North Ninth St., Allentown, Pa. 1918
Buzzell, R. S. (*F*) .... 801 East 5th St., Flint, Mich. 1914

Caird, Jas. M. (*L, E*) .... 271 River St., Troy, N. Y. 1900
Cairns, A. A., M. D. .... S. E. Cor. 7th and Medary Aves., Philadelphia, Pa. 1914
Caldwell, Chas. P., M. D. .... 4429 Michigan Ave., Chicago, Ill. 1916
California State Board of Health .... Box 587, Sacramento, Cal. 1916
Calver, H. N., B. S. (*F*) .... Health Dept., Municipal Bldg., Winston-Salem, N. C. 1917
Cameron, R. L., M. D. .... 114 Halleck St., Youngstown, Ohio 1915
Campbell, Albert E., M. D. (*F*) .... Railroad Health Officer, Chicago, Ill., Illinois Central R. R. Co. 1913
Campbell, Chas. H. R., M. D. .... P. O. Box 747, San Antonio, Tex. 1916
Capron, V. J., M. D. .... 930 Henry Bldg., Seattle, Wash. 1916
Carlson, Arthur J., M. D. (*P*) .... 1003 Detta Ave., Escanaba, Mich. 1915
Carlton, R. L. .... 214 Spring St., Winston-Salem, N. C. 1917
Carney, Andrew, Jr. (*P*) .... 121 Prospect St., Westfield, N. J. 1915
Carney, Thomas J., M. D. (*F*) .... Merchant's Reality Bldg., Alma, Mich. 1916
Carpenter, William F. .... 1316 Delamere Pl., Brooklyn, N. Y. 1915
Carr, E. Arthur, M. D. (*P, V, S*) .... 516 Bankers Life Bldg., Lincoln, Neb. 1910
Carroll, Thomas B., D. V. S. .... 106 North 2d St., Wilmington, N. C. 1915
Carson, Harry Y. (*E*) .... 90 West St., New York City 1914
Carter, Prof. Charles (*L*) .... Parsons College, Fairfield, Iowa 1916
Carter, E. B. (*F*) .... 810 East 25th St., Indianapolis, Ind. 1916
Cary, R. J., B. S., M. D. .... c/o Gen. Delivery, Livermore, Cal. 1916
Case, George W. (*E*) .... 3142 Avalon St., Pittsburgh, Pa. 1915
Cashell, I. M., D. V. M. .... City Health Officer and Bacteriologist, Goldsboro, N. C. 1918
Caswell, Harlon O., M. D. .... 81 North Main St., Ft. Atkinson, Wis. 1916
Cauchon, N. (*P, E*) .... Canada Life Bldg., Ottawa, Ont. 1912
Caverley, Chas. S. (*P*) .... Rutland, Vt. 1894
Cerswell, B. S., M. D. .... North Yakima, Wash. 1916
Chaddock, Prof. Robt. E. (*V*) .... 403 West 115th St., New York City 1915
Chalmers, Henry (*V*) .... State Health Dept., Albany, N. Y. 1914
Chamberlain, Leonard C., M. D. .... 2203 Marengo St., New Orleans, La. 1917
Chambers, B. S., E. R. .... Houghton, Mich. 1916
Chamot, E. M. (*F*) .... Cornell University, Ithaca, N. Y. 1905

Champion, Merrill E., M. D. (*L, P, V, S*)	50 Phillips St., Wollaston, Mass.	1915
Chandler, Prof. C. F.	Columbia University, New York City	1872
Chandler, David D. (*P*)	376 Roseville Ave., Newark, N. J.	1896
Chandler, N. J. R. (*F, P*)	104 E. Front St., Plainfield, N. J.	1914
Chapin, C. V., M. D. (*F, V*)	City Hall, Providence, R. I. (Honorary Member)	1886
Chapin, Mrs. Charles V. (*F*)	84 Keene St., Providence, R. I.	1916
Chapman, Frank T. (*E*)	104 West 42d St., New York City	1912
Chapman, G. A., M. D.	23 Elm St., Glen Falls, N. Y.	1915
Chase, E. S. (*L, E*)	State Health Dept., Albany, N. Y.	1909
Chase, John C. (*E*)	Derry Village, N. H.	1890
Chase, J. Frank (*F*)	200 Equitable Bldg., Boston, Mass.	1915
Cheatham, Arch M., M. D.	705 Cleveland St., Durham, N. C.	1914
Chesley, A. J., M. D. (*V, L, P, S*)	State Health Board, Minneapolis, Minn.	1909
Chester, John N. (*E*)	Union Bank Bldg., Pittsburgh, Pa.	1911
Chidester, W. S.	c/o Health Officer, Cristobal, C. Z.	1913
Child, Dorothy, M. D.	c/o Morgan Harjes & Co., Paris, France	1916
Chilson, Henry L., M. D.	408 Main St., Bradentown, Fla.	1914
Church, Frederick E.	Milwaukee County Hospital, Wauwatosa, Wis.	1917
Chynoweth, Wm. R., M. D.	Sanitarium, Battle Creek, Mich.	1917
Claffy, Thomas H.	10057 Longwood Dr., Chicago, Ill.	1914
Clapp, Sidney K.	Grand Gorge, N. Y.	1914
Clark, Edward, M. D.	573 Elliott Sq., Buffalo, N. Y.	1914
Clark, Herbert L., M. D.	City Bldg., Topeka, Kansas	1916
Clark, H. W. (*L, P, E*)	540 State House, Boston, Mass.	1896
Clark, P. F. (*L, F*)	Univ. of Wisconsin, Madison, Wis.	1906
Clay, Cassius L. (*F*)	La. State Board of Health, New Court Bldg., New Orleans, La.	1917
Cleghorn, Guy F. (*P*)	Mineola, N. Y.	1915
Cleveland, H. Burdett (*E*)	662 Myrtle Ave., Albany, N. Y.	1914
Clinton, George, M. D.	71 Grenville St., Pensax Court, Toronto, Ont.	1912
Clock, Ralph Oakley, M. D.	Pearl River, N. Y.	1917
Clore, Lex B. (*L*)	*Address unknown*	1913
Closson, Oliver E. (*L*)	336 Hurburt St., Detroit, Mich.	1908
Cobb, Chas. N. (*L*)	Supt., Water Works, Kankakee, Ill.	1908
Cobleigh, William M., M. A. (*L, F*)	909 South Third Ave., Bozeman, Mont.	1914
Coburn, William H. (*E*)	Waverly, Mass.	1914
Cochran, William F.	Woodbrook, Md.	1915
Codding, Edwin H., M. D.	City Dept. of Health, New Rochelle, N. Y.	1913
Coebus, B. C., M. D.	30 North Michigan Blvd., Chicago, Ill.	1917
Coffey, James C.	Room 6 City Hall, Worcester, Mass.	1916
~~Cogswell, William F.~~, M. D. (*V*)	Helena, Mont.	1913
Cohen, Barnett (*F*)	150 York St., New Haven, Conn.	1916
Cohen, J. X. (*V*)	104 City Hall, Syracuse, N. Y.	1915
Cohen, Morris (*S, V*)	946 Hoe Ave., New York City	1914
Colby, Bern D., M. D.	Sudbury, Vt.	1916
Cole, Hills, M. D. (*P, V*)	1748 Broadway, New York City	1907
Cole, R. W. E., M. D.	Epidemiologist, City Bldg., Akron, Ohio	1914
Coleman, George J.	2500 Chapline St., Wheeling, W. Va.	1917
Collins, Herbert O.	City Hospital, Minneapolis, Minn.	1914
Collins, Katherine R., M. D. (*L*)	State Health Board, Atlanta, Ga.	1910
Collins, P. O. (*E, F*)	City Bldg., Elyria, Ohio	1916
Collinson, John, M. D.	Deputy State Health Officer, Havre De Grace, Md.	1917
Colson, H. C., Jr. (*F*)	2809 Mt. Holly St., Baltimore, Md.	1914
Colton, Max J. (*P, F*)	Cumberland, Md.	1913
Columbus City Board of Health	Columbus, Ohio	1916
Congdon, Charles F., M. D. (*F*)	29 Willow St., Mystic, Conn.	1916
Congdon, Leon S., M. S.	1210 Boswell Ave., Topeka, Kans.	1917
Conklin, H. M.	San. Engr., 233 North Lincoln Way, Ames, Iowa	1917
Connell, W. T., M. D. (*L*)	11 Arch St., Kingston, Ont.	1908
Connolly, R. N., M. D. (*L, P*)	City Hospital, Newark, N. J.	1898
Consumers' League of Massachusetts, Inc.	4 Joy St., Boston, Mass.	1915
Conway, John A., M. D.	206 Main St., Hornell, N. Y.	1914
Cook, Alton A. (*F*)	370 Mechanic St., Clarksburg, W. Va.	1917
Cook, Dewitt, Jr.	70 Hawthorne Ave., East Orange, N. J.	1914
Cooke, Lane B., M. D.	Egan, Texas	1915
Coolidge, Ellen W.	81 Marlborough St., Boston, Mass.	1915
Coon, W. H., M. D.	Walnut and 59th Sts., Kansas City, Mo.	1917
Coote, H. L. B. (*I*)	312 East Michigan St., Michigan, Ind.	1915
Cornell, Walter S., M. D. (*P*)	729 City Hall, Philadelphia, Pa.	1915
Corwin, R. W., M. D.	Minniqua Hospital, Pueblo, Col.	1913
Cousineau, Aime	Health Dept., City Hall, Montreal, Que.	1915
Coward, Francis A., M. D. (*L, F*)	1410 Senate St., Columbia, S. C.	1912
Cowling, Hugh A., M. D.	210 South High St., Muncie, Ind.	1917
Cox, J. F.	P. O. Box 307, Winnipeg, Man.	1908
Cox, John W.	1316 Cheyenne Ave., Grand Forks, N. Dak.	1914

Cox, Robt. Lynn (*V, F*) .... Metropolitan Insurance Co., New York City 1913
Cox, W. H., M. D. .... 1936 Walnut St., Jacksonville, Fla. 1917
Craft, Clarence C., M. D. .... *Address unknown* 1914
Cramp, Arthur J., M. D. (*F*) .... 6606 Kimbark Ave., Chicago, Ill. 1917
Crane, Jacob L. (*E*) .... c/o State San. Engineer, 621 Oakland Bldg., Lansing, Mich. 1917
Crankshaw, Charles W., M. D. (*I, P*) .... Prudential Ins. Co., Newark, N. J. 1913
Craster, Charles V., M. D. (*F*) .... Department Public Health, City Health Board, Newark, N. J. 1916
Creel, Richard H., M. D. (*L*) .... 102 St. Charles Ave., New Orleans, La. 1915
Crigler, Wallace P., M. D. (*P, V*) .... 604 Cleveland St., Tampa, Fla. 1914
Crilly, I. B. (*E*) .... Health Officer, City Hall, Altoona, Pa. 1917
Crocker, Fred L. (*L*) .... Tenn. Coal, Iron & R. R. Co., Birmingham, Ala. 1912
Crockett, Robert L., M. D. .... 131 Main St., Oneida, N. Y. 1915
Crosley, Grace Pearce, D. V. M. .... 2421 South 6th St., Terre Haute, Ind. 1917
Croston, John F., M. D. .... 83 Emerson St., Haverhill, Mass. 1911
Crowder, T. R., M. D. (*L, I*) .... Pullman Bldg., Chicago, Ill. 1905
Crowe, John H., M. D. ...... Health Commissioner, First Nat. Bank Bldg., Virginia, Minn. 1917
Crum, Frederick S. (*V, F*) .... 751 Clifton Ave., Newark, N. J. 1907
Crum, H. H., M. D. (*P*) .... 300 East State St., Ithaca, N. Y. 1909
Crumbine, S. J., M. D. (*P*) .... State House, Topeka, Kans. 1912
Cuddeback, Edgar G., M. D. (*P*) .... Port Jervis, N. Y. 1915
Cummin, Gaylord C. .... City Manager, City Hall, Grand Rapids, Mich. 1917
Cumming, Hugh S. (*L*) ... Hygienic Laboratory, 25th and E Sts., N. W., Washington, D. C. 1914
Cummins, Earl H. .... 46 Westland Ave., Boston, Mass. 1916
Cummins, Herschel B. (*P, S*) .... Seward, Neb. 1910
Curry, Grove P. M., M. D. .... Mt. Kisco, N. Y. 1906
Curtis, Francis Geo., M. D. (*L*) .... City Hall, West Newton, Mass. 1897

Dalton, Charles F., M. D. (*V, L*) .... 52 North Winooski Ave., Burlington, Vt. 1912
Dame, Geo. A., M. D. .... Inverness, Fla. 1917
Daniels, F. E. (*L, P*) .... Ass't Engineer, Pennsylvania State Dept. of Health, 1409 North Front St., Harrisburg, Pa. 1909
Darling, Prof. Chester A. (*F*) .... Allegheny College, Meadville, Pa. 1915
Davis, Charles O. (*E*) .... 422 4th St., Milwaukee, Wis. 1914
Davis, Joe Dyer, M. D. .... Munday, Tex. 1914
Davis, Lewis (*L*) .... Parke Davis & Co., Detroit, Mich. 1913
Davis, Michael M., Jr., Ph. D. (*V*) .... 58 Shepard St., Cambridge, Mass. 1915
Davis, Neslon C., M. D. .... 494 Rutherford Ave., Boston, Mass. 1914
Davis, William H., M. D. (*V*) .... 3764 Patterson St., Washington, D. C. 1911
Dawson, Charles F. .... Jacksonville, Fla. 1914
Deacon, W. J. V. (*V*) .... 1254 Polk St., Topeka, Kans. 1912
Dean, J. Atlee (*F*) .... 5420 Baltimore Ave., Philadelphia, Pa. 1915
Dearholt, Hoyt E., M. D. .... 471 Van Buren St., Milwaukee, Wis. 1910
Decker, A. Clinton (*L, E*) .... Box 790, Birmingham, Ala. 1911
Deeds, F. E., Ph. C., B. A. .... 295 West Second Ave., Columbus, Ohio 1916
DeForest, Robert W. (*S*) .... 30 Broad St., New York City 1912
De Kleine, William, M.D. .... 909 Belmont Ave., Flint, Mich. 1915
Delamater, Hasbrouck, M. D. (*F*) .... Health Commissioner, St. Joseph, Mo. 1916
Delano, William, M. D. (*P*) .... 510 South Union St., Grand Rapids, Mich. 1907
Delaware State Board of Health (*P*) .... 504 Delaware Ave., Wilmington, Del. 1909
Dennis, S. C. .... College Park, Md. 1915
Denny, Francis P., M. D. (*L, P*) .... 111 High St., Brookline, Mass. 1901
Denny, Henry W. (*L*) .... 1514 Davis St., Evanston, Ill. 1917
DePree, Con .... Holland, Mich. 1912
DePree, James .... 902 Chamber Commerce Bldg., Chicago, Ill. 1915
DelRosario, Salvador, Med. Dr. .... c/o Philippine Health Ser., Manila, P. I. 1916
Derivaux, Robt. C., M. D. .... 25th and E Sts., Washington, D. C. 1915
Dickinson, G. K., M. D. .... 278 Montgomery St., Jersey City, N. J. 1905
Dickinson, May B. .... Trinity Ct., Dartmouth St., Boston, Mass. 1915
Dickson, Hugh F. .... 26 Washington Ave., Covington, Tenn. 1914
Diggett, E. W. (*P*) .... Tallahassee, Fla. 1911
Dight, Charles F., M. D. .... 4318 39th Ave., Minneapolis, Minn. 1916
Dike, I., A. M., M. D. .... York, N. Y. 1915
Dingle, J. H. .... City Hall, Charleston, S. C. 1910
Dinsmore, Sanford C. (*F*), Commissioner Food and Drugs, 223 University Ter., Reno, Nev. 1917
Dinwiddie, Courtney (*V, I, S*) .... 209 West 12th St., Cincinnati, Ohio 1916
Dittmer, H. A., M. D. .... Manchester, Iowa 1916
Dittoe, William H. (*L, E*) .... Ohio State Board of Health, Columbus, Ohio 1913
Dix, Sherwood, M. D. .... County Health Officer, Port Norfolk, Va. 1916
Dixon, Samuel G., M. D. (*V*) .... 1900 Race St., Philadelphia, Pa. 1905
Dobbin, R. L., Ba. Sc. .... 253 Hunter St., Peterborough, Ont. 1917
Dobbs, Clarence H., M. D. (*F*) .... Asst. to State Health Officer, Jacksonville, Fla. 1914
Dodd, John M., M. D. .... 610 Ellis Ave., Ashland, Wis. 1913
Dodd, W. L. (*L*) .... c/o *Delineator*, Spring and McDougall Sts., New York City 1912

Dodson, Fred S.	82 Union Ave., Framingham, Mass.	1917
D'Olier, William L.	702 Morris Bldg., Philadelphia, Pa.	1915
Domingues, A. G., M. D. (*L, P*)	Box 1131, Havana, Cuba	1911
Donaldson, Wellington	Birmingham Water Works, Birmingham, Ala.	1915
Donley, J. V.	13 College Ct., Montgomery, Ala.	1917
Doolittle, Roscoe L. (*L, E, F*)	805 Michigan Ave., Evanston, Ill.	1912
Dorman, Joseph (*E*)	2117 Center St., Berkeley, Cal.	1916
Dorset, M., M. D. (*F, L*)	U. S. Dept. of Agriculture, Washington, D. C.	1900
Dotterrer, Wm. D. (*F*)	140 West Ontario St., Chicago, Ill.	1916
Doty, Alvah H., M. D. (*V*)	205 West 57th St., New York City	1896
~~Douglas, A. J., M. D.~~ (*P, V*)	City Health Dept., Winnipeg, Man.	1903
Doupe, G. Lonsdale (*L*)	c/o C. P. R. R., Winnipeg, Man.	1906
Dowling, J. D., M. D.	104 Court House, Birmingham, Ala.	1917
~~Dowling, Oscar~~ W., M. D.(*P, V, F*)	Pres., State Board of Health, New Orleans, La.	1911
Downes, John R.	Green Brook Park, Bound Brook, N. J.	1915
Downs, A. Sherman, M. D. (*V, P*)	139 Circulor St., Saratoga, N. Y.	1914
Drake, Chester F. (*V*)	Filtration Works, Aspinwall, Pa.	1914
Drake, C. St. Clair, M. D. (*V, P*)	Springfield, Ill.	1914
Drake, John J., M. D.	896 Ridge Road, Lackawanna, N. Y.	1917
Dresser, Richard	54 College St., Providence, R. I.	1915
Dresslar, Fletcher B., Ph. D. (*S*)	Peabody College, Nashville, Tenn.	1911
Dreyfus, William (*L*)	57 East 96th St., New York City (Sustaining member)	1905
Drinkwater, Ernest, C. E.	588 Bird St., St. Lambert, Que.	1914
Drown, Frank S.	Children's Bureau, U. S. Dept. of Labor, Washington, D. C.	1916
Dublin, Louis I. (*V*)	1 Madison Ave., New York City	1912
Dubois, Alexander N. (*F*)	Box 516, Fort Payne, Ala.	1916
Duff, Paul H., S. B.	5 Dexter Row, Charlestown, Mass.	
Duffield, Thomas J. (*P*)	P. O. Box 272, Summit, N. J.	
Duke, John W., M. D.	Guthrie, Okla.	1917
Duncan, Ellis M., M. D. (*L, P*)	City Hall, Birmingham, Ala.	1909
Dungan, Samuel O.	1100 East 15th St., Indianapolis, Ind.	1913
Dunham, Edward K., M. D. (*L*)	35 East 68th St., New York City	1905
Dupray, Martin, M. S.	425 Carroll St., Akron, Ohio	1917
~~Durgin, Samuel H.~~, M. D.	Millbrook, Mass. (Honorary member)	1875
Durkee, C. Josephine (*P*)	186 State St., Albany, N. Y.	1915
Duryee, Charles Chauncy, M. D. (*P, S*)	1352 Union St., Schenectady, N. Y.	1914
Dutton, C. E., M. D. (*P*)	602 Cicoller Ave., Minneapolis, Minn.	1913
Dyer, Elbridge G. (*P, E*)	1905 East 73d St., Cleveland, Ohio	1911
Eakins, Wallace T. (*P*)	State Dept. of Health, Trenton, N. J.	1914
Earl, George G. (*E*)	502 City Hall Annex, New Orleans, La.	1902
Eason, Sam E., M. D.	New Albany, Miss.	1914
Eastman, George	Rochester, N. Y. (Honorary member)	1915
Eastman, Paris Ripley (*S, V*)	c/o Div. of Vital Statistics, N. Y. State Dept. of Health, Albany, N. Y.	1917
Easton, Ernest D.	45 Clinton St., Newark, N. J.	1915
Eaton, C. A., M. D. (*L*)	535 Beacon St., Boston, Mass.	1912
Ebersole, William G.	800 Schofield Bldg., Cleveland, Ohio	1914
Eddy, Harrison P. (*L, E*)	14 Beacon St., Boston, Mass.	1910
Edmison, John H., M. D. (*P*)	216 13th St., Brandon, Man.	1913
Edmonton, Alberta	Provincial Medical Officer of Health, Edmonton, Alberta	1915
Edsall, Frank H., M. D. (*P*)	1311 West 13th St., Wilmington, Del.	1914
Edwards, Martin R. (*L, P*)	7 Marlborough St., Boston, Mass.	1914
Egbert, Seneca, M. D.	4814 Springfield Ave., Philadelphia, Pa.	1916
Eichel, Otto R., M. D. (*V*)	28 Chestnut St., Albany, N. Y.	1915
Eisenberg, Arthur A., M. D.	St. Vincent Charitable Hosp., Cleveland, Ohio	1915
Elgin, W. F., M. D. (*L*)	City Health Board, Glenolden, Pa.	1900
Elliott, George A. I. S. E.	Sanitary Officer, N. W. Ry., Karachi Cantt, India	1916
Elliott, Ralph W., M. D.	10509 Euclid Ave., Cleveland, Ohio	1915
Ellison, J. Austin	6th and King Sts., Wilmington, Del.	1915
Ellms, J. W. (*L*)	2812 Madison Rd., Cincinnati, Ohio	1897
Elwood, E. S. (*F*)	The Capitol, Albany, N. Y.	1915
Emerson, Charles A., Jr. (*E*)	State Health Board, Harrisburg, Pa.	1907
Emerson, C. S., M. D.	81 Mt. Auburn St., Watertown, Mass.	1917
Emerson, Guy C.	5 Agassiz Park, Boston, Mass.	1914
Emerson, Haven, M. D. (*P, V, F*)	120 East 62d St., New York City	1914
Emerson, Herbert C., M. D. (*L, P*)	135 Chestnut St., Springfield, Mass.	1899
Engel, P. W. (*E*)	38 South Dearborn St., Chicago, Ill.	1916
Ennis, F. J.	518 South Union St., Burlington, Vt.	1916
Epplen, Frederick, M. D.	Paulsen Bldg., Spokane, Wash.	1916
Eppstein, Ralph M., Ph. C., M. D. (*F*)	1554 South Trumbull Ave., Chicago, Ill.	1917
Ernst, Harold C., M. D. (*L*)	Harvard Medical School, Boston, Mass.	1915
Escoto, Fred G., M. D. (*L*)	113 Independence St., Mantanzos, Cuba	1911
Eskew, Harry L., Ph. G. (*F*)	Capitol Annex, Nashville, Tenn.	1917

Esquerre, Prof. E.	Carnegie Tech. School, Oakland Sta., Pittsburgh, Pa.	1916
Estabrook, Arthur F. (*E*)	15 State St., Boston, Mass.	1909
Evans, Edward, M. D.	E. A. C. S., State Bank Bldg., La Crosse, Wis.	1916
Evans, E. Geo.	522 Van Dyke St., Detroit, Mich.	1915
Evans, E. Walter (*V*, *E*)	240 Oak St., Cincinnati, Ohio	1915
Evans, H. D., M. D. (*L*, *F*)	4 Lambard Court, Augusta, Me.	1905
~~Evans, Wm. A., M~~. D. (*L*, *P*, *S*, *V*)	906 Tribune Bldg., Chicago, Ill.	1905
Everhardy, Jacob L., M. D.	Axa Bldg., Leavenworth, Kans.	1913

Fabela, Octavino G., M. D. (*L*)	10 De La Violeta, No. 8, Mexico, Mex.	1901
Fahey, Edward W., M. D.	217 New Jersey Bldg., Duluth, Minn.	1915
Fahrney, Bert Emory, M. D.	720 1st St., La Salle, Ill.	1916
Fales, Almon L. (*L*)	15 Westbourne Rd., Newton Center, Mass.	1910
Fales, W. Thurber	City Health Board, Herman St., Glen Ridge, N. J.	1917
Farnam, Prof. Henry Walcott	43 Hillhouse Ave., New Haven, Conn.	1914
Farquhar, A. B.	York, Pa.	1880
Farrand, Livingston, M. D. (**S*, *V*)	Univ. of Colorado, Boulder, Colo.	1910
Faulkner, J. Leo (*F*)	1218 Leighton Ave., Anniston, Ala.	1917
Feezer, L. W. (*V*)	469 Selby Ave., St. Paul, Minn.	1915
Fehr, Gordon, B. S., S. B.	Box 647, South Norwalk, Conn.	1917
Feiss, Paul L.	12600 Cedar Rd., Cleveland Heights, Ohio	1915
Feiss, Richard A.	2149 West 53d St., Cleveland, Ohio	1916
Fell, Alton S., M. D. (*P*)	529 East State St., Trenton, N. J.	1908
Ferguson, Franklin A., M. D.	705 Congress St., Portland, Me.	1912
Ferguson, Harry F. (*S*)	State Water Survey, Urbana, Ill.	1916
Fernando, Montilla J.	Ayuntamento Bldg., San Juan, Porto Rico	1915
Ferry, N. S., M. D. (*L*)	430 Montclair Ave., Detroit, Mich.	1910
Fetherston, John T. (*E*)	44 West 9th St., New York City	1914
Fiedler, Otho, M. D.	Sheboygan, Wis.	1913
Findley, Joseph D., M. D.	802 12 St., Altoona, Pa.	1916
Finigan, Elizabeth M.	42 Phelps St., Lyons, N. Y.	1915
Fink, Emanuel B. (*V*)	5535 Maryland Ave., Chicago, Ill.	1917
Finn, Edward W., M. D.	5 Franklin Sq., Dedham, Mass.	1917
Fish, Lewis, M. D.	86 Day St., Fitchburg, Mass.	1915
Fishburne, Skottowe B., M. D.	1400 Hampton St., Columbia, S. C.	1915
Fisher, Prof. Irving (*E*, *V*)	New Haven, Conn.	1903
Fisher, E. A. (*E*)	30 Albenarle St., Rochester, N. Y.	1915
Fisher, L. M.	Ass't Engr. Pennsylvania State Health Dept., Harrisburg, Pa.	1917
Fisk, Eugene Lyman, M. D. (*S*, *V*, *F*)	25 West 45th St., New York City	1915
Fitch, Clifford P.	1346 Raymond Ave., St. Paul, Minn.	1915
Fitzgerald, James O., M. D.	1110 Capitol St., Richmond, Va.	1914
Fitzgerald, Prof. J. G. (*L*)	Univ. of Toronto, Toronto, Ont.	1912
FitzRandolph, R. B. (*L*, *F*)	State Dept. of Health, Trenton, N. J.	1905
Flanagan, E. L., M. D.	Fairfax, Va.	1915
Flanary, David L., M. D.	1027 Troy St., Dyersburg, Tenn.	1914
Flick, Lawrence F., M. D.	732 Pine St., Philadelphia, Pa.	1890
Flinn, Thos. W. P., M. D.	84 Morris St., Halifax, N. S.	1915
Flocken, Charles F., D. V. M. (*L*)	2624 Emerson Ave., South, Minneapolis, Minn.	1904
Floyd, Meldrum B., M. D.	148 Squirrel Rd., Dayton, Ohio	1915
Follin, James W.	Sanitary Engineer, City Engineering Dept., Flint, Mich.	1914
Folsom, Edward G.	107 North Gratiot Ave., Mt. Clemens, Mich.	1916
Folsom, Wm. C. (*P*)	City Health Office, Cincinnati, Ohio	1911
Foote, Charles J., M. D. (*L*)	60 Elm St., New Haven, Conn.	1895
Forbes, F. B. (*L*)	540 State House, Boston, Mass.	1905
Ford, C. E., M. D. (*P*, *E*, *F*)	c/o General Chemical Co., 25 Broad St., New York City	1910
Forsythe, Warren, M. D.	Ann Harbor, Mich.	1917
Foster, Harry E., M. D.	609 Santa Ray Ave, Oakland, Cal.	1915
Foster, R. F., M. D.	29 North Portage St., Westfield, N. J.	1915
Foster, Prof. Wm. Trumbower (*F*)	707 Coleman St., Easton, Pa.	1916
Foster, W. Brownley, M. D. (*P*, *V*)	Roanoke, Va.	1908
Fox, Carroll, M. D. (*V*)	Hygienic Laboratory, 25th and E Sts., Washington, D. C.	1915
Fox, Herbert, M. D. (*L*)	3209 Locust St., Philadelphia, Pa.	1915
Fox, H. F. (*S*)	50 Union Sq., New York City	1911
Fox, Richard T.	20 East Goethe St., Chicago, Ill.	1916
Francis, Walter J.	260 St. James St., Montreal, Que.	1914
Frank, Leslie C.	Hygienic Laboratory, 25th and E Sts., Washington, D. C.	1914
Frankel, Lee K., Ph. D. (*F*, *V*)	1 Madison Ave., New York City	1909
Frankforter, G. B., M. D. (*F*)	525 River Rd., Minneapolis, Minn.	1915
~~Fraser, M. S., M. D~~.	Chief Medical Officer of Manitoba, Winnipeg, Man.	1916
Freeburn, H. M., B. S.	University Club, State College, Pa.	1917
Freeman, A. W., M. D. (*L*, *P*, *V*)	State Dept. of Health, Columbus, Ohio	1907
French, Frank E.	4907 Stewart Ave., Cincinnati, Ohio	1914
French, G. E., M. D.	Elyria, Ohio	1917
Frey, John G., M. D.	Health Dept., City Hall, Cleveland, Ohio	1917

Fricks, L. D.	Hygienic Lab., Washington, D. C.	1915
Friedrich, Martin, M. D. (*P, V*)	3226 14th St., Cleveland, Ohio	1905
Fronczak, Francis E., M. D. (*P, V*)	Health Dept., Buffalo, N. Y.	1910
Frost, W. D., M. S., Ph. D. (*L*), Dr. Public Health	210 North Orchard St., Madison, Wis.	1904
Frost, W. H., M. D. (*L*)	3d and Kilgour Sts., Cincinnati, Ohio	1909
Fryer, Claude Percival, M. D.	c/o State Board of Health Lab., Jacksonville, Fla.	1917
Fueretes, James H.	140 Nassau St., New York City	1913
Fuller, Caleb A. (*L, F*)	71 Charles Field St., Providence, R. I.	1905
Fuller, George W. (*L, E*)	170 Broadway, New York City	1892
Fuller, Myron Elmer	7131 Cresheim Rd., Philadelphia, Pa.	1917
~~Fulton, J. S.,~~ M. D. (*L, V*)	16 North Saratoga St., Baltimore, Md.	1897
Funk, Chester C., M. D.	315 East Spring St., New Albany, Ind.	1916
Funk, F. J.	*Address unknown*	1916
Furbush, C. L., M. D. (*V, F*)	Hotel Powhatan, Pennsylvania Ave., 18th and H Sts., Washington, D. C.	1911
Furman, Davis, M. D.	Greenville, S. C.	1914
Furniss, H. W., M. D.	52 Vernon St., Hartford, Conn.	1900
Furstman, Jacob W. (*P*)	City Hall, La Crosse, Wis.	1912
Gable, Isaac C., M. D.	46 South Beaver St., York, Pa.	1897
Gage, E. H.	518 Main St., South Weymouth, Mass.	1917
Gage, S. De M. (*L, E*)	310 State House, Providence, R. I.	1901
Gagnon, Jules	North Star Chemical Works, Lawrence, Mass.	1917
Gaines, Richard H. (*L*)	49 Lafayette St., New York City	1909
Galarreta, Luis Adan, M. D. (*S*)	Secretaria De Sanidad, Habana, Cuba	1917
Gale, George B., M. D.	457 Prospect Ave., Newark, N. J.	1909
Gallivan, Wm. J., M. D.	743 Broadway, South Boston, Mass.	1912
Garcia, Alexander, M. D.	2000 Arch St., Philadelphia, Pa.	1915
Gardner, Chas. A., M. D.	Columbus, Mont.	
Garrett, Harry D. (*F*)	401 Court House, Minneapolis, Minn.	1917
Garrison, Ira M., M. D.	East Greenbush, N. Y.	1915
Gaub, John (*L, F*)	426 Columbia Rd., Washington, D. C.	1912
Gavett, Andrew	151 North Ave., Plainfield, N. J.	1915
Gavett, Weston	312 West 5th St., Plainfield, N. J.	1917
Gaw, Cooper	City Health Board, New Bedford, Mass.	1916
Gaylord, Charles W.	93 South Main St., New Haven, Conn.	1917
Gebhardt, Frederick H., M. D.	43 Washington St., Rutland, Vt.	1914
Geer, Lawrence P., B. S.	City Hall, Berlin, N. H.	1917
Gehrmann, Adolph, M. D. (*L*)	3815 Ellis Ave., Chicago, Ill.	1895
Geidel, C. D. (*L, F*)	U. S. Food & Drug Insp. Sta., 310 Federal Office Bldg., Minneapolis, Minn.	1914
Geier, Otto P., M. D.	Cincinnati Milling Machine Co., Oakley, Cincinnati, Ohio	1916
George, W. Egerton, M. D.	North Bay, Ont.	1912
Georgia, F. R. (*F*)	1331 Pine St., Scranton, Pa.	1917
Gerhard, William P., M. D. (*E*)	42d St. Bldg., New York City	1880
Germer, Hermann G.	221 North Main St., Canastota, N. Y.	1915
Gery, Charles G. (*E*)	5336 Wingohocking Ter., Germantown, Pa.	1910
Gibbs, Stuart Winifred (*F*)	Mechanics Institute, Rochester, N. Y.	1917
Gigger, A. George, M. D. (*F*)	State Board of Health, Providence, R. I.	1917
Gillespie, C. G.	Chief Engr., California State Board of Health, Berkeley, Cal.	1915
Gillespie, Julian M., M. D.	Ellis Island, N. Y.	1915
Gillette, Omer R., M. D. (*P, V*)	7 Bank Bldg., Colorado Springs, Colo.	1912
Gilleylen, J. D., M. D.	Jackson, Miss.	1916
Gillihan, Allen F., M. D.	*Address unknown*	1913
Gilliland, S. H., M. D. (*L*)	Ambler, Pa.	1900
Gilman, Laura Leonard	East 22d St., Ashland, Wis.	1917
Giltner, Prof. Ward (*F*)	340 Oak Hill Ave., East Lansing, Mich.	1914
Girdlestone, C. W., A. B., M. D.	1305 Main St., Riversdale, Cal.	1916
Gladding, Raymond D.	Box 422, Wilson, N. C.	1915
Glenn, John M. (*P*)	130 East 22d St., New York City	1910
Glennon, Joseph R.	City Board of Health, New Bedford, Mass.	1916
Glover, James W. (*V*)	620 Oxford Rd., Ann Harbor, Mich.	1914
Gockley, Roy R.	Canton, N. Y.	1917
Godfrey, Edward S., Jr., M. D. (*E, V*)	State Dept. of Health, Albany, N. Y.	1910
Godfrey, Hollis (*E*)	Drexel Institute, 32d and Chestnut Sts., Philadelphia, Pa.	1913
Goldberger, Jos., M. D. (*L*)	25th and E Sts., Washington, D. C.	1909
Goldwater, S. S., M. D. (*P*)	Mt. Sinai Hospital, New York City	1902
Goler, G. W., M. D. (*F*)	Rochester Health Bureau, Rochester, N. Y.	1900
Goltman, M., M. D. (*P*)	1500 Union Ave., Memphis, Tenn.	1912
Goodnough, X. H. (*E*)	State House, Boston, Mass.	1914
Gordon, James R. (*V, P*)	Deputy State Registrar, Raleigh, N. C.	1909
Gordon, John Boyle (*L*)	676 Richmond Ave., Buffalo, N. Y.	1914
Gordon, R. I. (*L*)	302 West Francis Ave., Tampa, Fla.	1914
Gore, John K.	Prudential Insurance Co., Newark, N. J.	1918

Gorgas, Wm. C., M. D.	Surg.-Gen. U. S. A. (Honorary member), Washington, D. C.	1901
Gorham, Frederick P. (*L, F*)	Brown University, Providence, R. I.	1899
Gorter, Nathan R., M. D. (*P*)	1 West Biddle St., Baltimore, Md.	1914
Gould, Chas. M., M. D.	City Health Officer, Superior, Wis.	1914
Gould, Wm. H. (*P*)	Lucas County Court House, Toledo, Ohio	1913
Govers, Frank X. (*L*)	Chemists Club, New York City	1914
Graf, A. V. (*L*)	3837 Wyoming St., St. Louis, Mo.	1914
Graf, W. J., B. A., M. D.	3031 Reading Rd., Cincinnati, Ohio	1916
Graham, Douglas S.	5336 Willis Ave., Dallas, Tex.	1916
Graham-Rogers, C. T., M. D. (*I, L, E, S*)	R. F. D. 47, Box 29, Ridgefield, Conn.	1912
Gram, Franklin C., M. D. (*P, V*)	849 Humboldt St., Buffalo, N. Y.	1907
Grandfield, Robert E.	124 Brown Ave., Roslindale, Mass.	1915
Grandy, Charles R., M. D. (*V, F*)	101 Free Mason St., Norfolk, Va.	1907
Grant, Wm. (*E*)	2420 r St., Lincoln, Neb.	1913
Grassick, James, M. D. (*P, V*)	Grand Forks, N. D.	1910
Graves, E. E., M. D.	14 Elm St., Penacook, N. H.	1886
Graves, Kenneth D.	City Hall, Richmond, Va.	1914
Gray, Albert S., M. D.	118 North La Salle St., Chicago, Ill.	1916
Gray, Ethan A., M. D.	2744 Pine Grove Ave., Chicago, Ill.	1917
Gray, George M.	286 Third St., Cambridge, Mass.	1914
Gray, Harold F., M. S. (*P*)	City Hall, Chico, Cal.	1911
Gray, Samuel M. (*E*)	10 Weybosset St., Providence, R. I.	1891
Gray, Thomas N., M. D.	William and Plane Sts., Newark, N. J.	1916
Greeley, Samuel A. (*E*)	200 Chestnut St., Winnetka, Ill.	1912
Green, Frederick R., M. D.	535 North Dearborn St., Chicago, Ill.	1915
Green, F. W. (*L, E*)	Little Falls, N. J.	1915
Green, H. W., A. B., S. B. (*E*)	Miroflores Filter Plant, Corozal, C. Z.	1916
Greenberg, D.	Yale School of Medicine, New Haven, Conn.	1914
Greene, Willard Parker, M. D.	81 Arthur Ave., Minneapolis, Minn.	1917
Greenfield, Myrtle (*L*)	Lawrence, Kans.	1913
Gregory, Charles E.	100 West Main St., Mt. Kisco, N. Y.	1915
Gregory, John H. (*E*)	Consulting Hydraulic Engr. and Sanitary Expert, 170 Broadway, New York City	1912
Grier, A. M.	Room 940 Du Pont Bldg., Wilmington, Del.	1917
Griffin, Chas. A.	Dept. of Health, Eastman Park Laboratory, Poughkeepsie, N. Y.	1915
Griffin, John J., M. D.	419 Ashun St., Sault St. Marie, Mich.	
Grimm, Randolph M., M. D. (*V*)	U. S. P. H. S., Spartanburg, S. C.	1915
Grindley, Prof. Harry S. (*L, F*)	Urbana, Ill.	1910
Grinnell, Francis B., M. D. (*L*)	240 Longwood Ave., Boston, Mass.	1914
Griswold, Don M. (*L*)	International Health Board, 61 Broadway, New York City	1914
Groeniger, Wm. C. (*S*)	522 Vermont Pl., Columbus, Ohio	1917
Grossman, Gaison (*P*)	506 Central Ave., Rochester, N. Y.	1915
Grubbs, Samuel B., M. D.	53d and River Sts., Newport News, Va.	1902
Gruener, Prof. Hippolyte	2089 Cornell Rd., Cleveland, Ohio	1914
Guilford, H. M., M. D. (*F*)	1820 Hawthorne Ave., Minneapolis, Minn.	1916
Guilfoy, W. H., M. D. (*V*)	141 Center St., New York City	1907
Guion, Edward, M. D. (*F*)	P. O. Box 418, Atlantic City, N. J.	1905
Guiteras, Juan, M. D. (*L*)	Las Animas Hospital, Havana, Cuba	1902
Guiteras, Ramon, M. D. (*V*)	80 Madison Ave., New York City	1904
Gundrum, Frederick F., M. D. (*L*)	401 Cap. Nat. Bank Bldg., Sacramento, Cal.	1913
Gunn, Mrs. Selskar M.	55 Burnett St., East Orange, N. J.	1915
Gunn, Prof. Selskar M. (*I, L, P, S*)	12 rue Boissy d' Anglas, Paris, France	1905
Gwinn, V. H., M. D.	State Board of Health, Jacksonville, Fla.	1917

Hachtel, F. W., M. D. (*L*)	122 West Lafayette St., Baltimore, Md.	1909
Hackett, J. D. (*I*)	72 North Parsons Ave., Flushing, L. I.	1917
Hadfield, Wm. A.	939 Spaight St., Madison, Wis.	1917
Hagan, James J. (*V, S, F*)	44 Fleet St., Jersey City, N. J.	1916
Haine, William (*L*)	11 Laurel St., Hartford, Conn.	1914
Hale, Frank E. (*L*)	Mt. Prospect Laboratory, Flatbush Ave. and Eastman Pky, Brooklyn, N. Y.	1916
Hale, Harrison, Ph. D.	Whitcomb Chemical Lab., Drury College, Springfield, Mo.	1918
Hall, E. P., M. D.	220 Audobon Ave., New York City	1915
Hall, Harry R.	16 West Saratoga St., Baltimore, Md.	1915
Hall, John (*F*)	441 Main St., East Orange, N. J.	1914
Hall, Pearl M., M. D. (*P, V*)	1007 Fremont Ave. North, Minneapolis, Minn.	1908
Hallenbreck, O. J., M. D.	11 Court St., Canandaigua, N. Y.	1917
Halliday, J. D.	465 4th St., Brooklyn, N. Y.	1916
Halsey, William, M. D. (*E*)	*Address unknown*	1911
Hamblin, A. C., M. D.	905 South Orleans Ave., Tampa, Fla.	1917
Hamilton, Alice, M. D. (*I, L, S*)	Mackinac Island, Mich.	1913
Hamilton, Herbert C. (*F, L*)	c/o Park Davis & Co., Detroit, Mich.	1913
Hamilton, H. W.	251 Pleasant St., Brockton, Mass.	1917
Hamilton, R. D., M. D.	220 High St., Newburyport, Mass.	1918

Hamlin, Fred E., M. D.	Stanton, Va.	1916
Hammer, B. W. (L, E)	Iowa State College, Ames, Iowa	1909
Hamner, N. C. (F)	Municipal Bldg., Dallas, Tex.	1915
Hand, E. Alexander, M. D.	35 Townsend St., Walton, N. Y.	1915
Hanford, Peter Oliver, M. D.	720 North Nevada Ave., Colorado Springs, Colo.	1913
Hannum, M. M., M. D.	Eustis, Fla.	1916
Hanor, Welcome A., M. D.	118 East Erie Ave., Corning, N. Y.	1915
Hansen, August E. (L, E)	2 Rector St., New York City	1916
~~Hansen, Paul (L,~~ E)	Chief Engr., Illinois State Board of Health, Springfield, Ill.	1905
Hanson, Henry, M. D. (L)	317 West 10th St., Jacksonville, Fla.	1910
Harding, Prof. H. A. (L, F)	College of Agriculture, Urbana, Ill.	1908
Harley, Mary, M. D. (F)	Sweet Briar College, Sweet Briar, Va.	1914
Harman, Ira C., M. D., A. B.	78 Illinois St., Chicago Heights, Ill.	1916
Harmon, Gaius E., M. D.	Western Reserve Univ., 1353 East 9th St., Cleveland, Ohio	1914
Harper, C. A., M. D. (V)	15 Pickney St., Madison, Wis.	1904
Harrington, F. E., M. D. (F)	Court House, Anniston, Ala.	1910
Harrington, Thomas F., M. D.	Deputy Comm'r of Labor, 1 Beacon St., Boston, Mass.	1916
Harris, Cummings, M. D.	1124 Cummings St., Memphis, Tenn.	1915
Harris, D. L., M. D. (L. P)	Metropolitan Bldg., St. Louis, Mo.	1908
Harris, Henry F., M. D.	State Health Board, Atlanta, Ga.	1914
~~Harris, Louis I., M. D.~~ (S)	1855 Seventh Ave., New York City	1915
Harris, Norman MacL., M. D. (L)	University of Chicago, Chicago, Ill.	1899
Harrison, Samuel Charles	1350 Liberty St., Jacksonville, Fla.	1914
Harrison, Shelby M. (F)	130 East 22d St., New York City	1915
Harkness, Robert R.	York Village, Me.	1917
Hart, Bertrand M., M. D.	Onida, S. Dak.	1917
Hart, Capt. W. L., M. C. (F)	U. S. A., c/o Surg.-Gen. of the Army, Washington, D. C.	1916
Hartloff, Chas. W., M. D. (V)	Room 313, Int. Life Bldg., Evansville, Ind.	1913
Harvey, P. W.	9619 Lake Shore Blvd., Cleveland, Ohio	1912
Haskell, Chas. Nohum, M. D.	787 Fairfield Ave., Bridgeport, Conn.	1917
Haskins, Chas. A. (E)	705 Main St., Lawrence, Kan.	1913
Hasseltine, H. E., M. D. (L)	Hygienic Laboratory, Washington, D. C.	1916
Hassler, William C., M. D.	Health Officer, 1085 Mission St., San Francisco, Cal.	1916
~~Hastings, Chas. J., M. D. (P, V)~~	Municipal Bldg., Toronto, Ont.	1911
Hastings, Prof. Edwin G. (L, F)	College of Agriculture, Madison, Wis.	1913
Hastings, George A.	105 East 22d St., New York City	1915
Hatfield, Chas. J., M. D. (V, S)	2008 Walnut St., Philadelphia, Pa.	1913
Hattie, W. H., M. D.	Halifax, N. S.	1913
Hatton, T. Chalkley (E)	City Hall, Milwaukee, Wis.	1910
Hatton, Edward H.	6032 Stoney Island Ave., Chicago, Ill.	1915
Hauser, Stephen J. (L)	1669 Cedar Ave., Cincinnati, Ohio	1914
Hayes, Oscar, M. D.	1539 Broadway, Denver, Colo.	1913
Hayes, W. D. (L, F)	City Hall, Sioux City, Ia.	1914
Hayhurst, Emery R., M. D. (P, V, F)	College of Medicine, Ohio State Univ., Columbus, Ohio	1913
~~Hayne, James A.,~~ M. D. (V)	Palmetto Bldg., Columbia, S. C.	1911
Hazen, Allen (L, E)	42d St. Bldg., New York City	1892
Hazlehurst, George H. (E)	c/o Henry E. Elrod, Interurban Bldg., Dallas, Tex.	1913
Hazlehurst, James Nesbit (E, S)	P. O. Box 1273, Atlanta, Ga.	1912
Heard, James D., M. D. (L)	Caridographic Lab., St. Francis Hosp., 45th St., Pittsburgh, Pa.	1915
Heckard, M. D., M. D. (P, V)	5416 Wayne Ave., Chicago, Ill.	1907
Hektoen, Ludvig, M. D. (L)	637 South Wood St., Chicago, Ill.	1915
~~Hedrich, A. W. (V)~~	7 Ware St., Cambridge, Mass.	1916
Heflin, H. Neilson, M. D.	Fischer Bldg., Kewanee, Ill.	1917
Heinemann, P. G., M. D. (L, F)	Woodworth, Wis.	1906
Heiser, Victor G., M. D.	61 Broadway, New York City	1913
Henderson, Andrew, M. D.	Powell River, Vancouver, B. C.	1915
Henry, C. P., M. D.	846 Center Ave., Reading, Pa.	1914
Henson, Graham E.	334 St. James Bldg., Jacksonville, Fla.	1914
Herbert, Thomas G. (P)	1906 Sixteenth St., Altoona, Pa.	1909
~~Hering, Dr. Rudolph~~ (E)	170 Broadway, New York City	1878
Herms, Wm. B. (L)	1424 Le Roy Ave., Berkeley, Cal.	1912
Herndon, R. F., M. D.	727 Kress Bldg., Houston, Tex.	1916
Herring, Robert A.	U. S. Marine Hospital, Louisville, Ky.	1915
Herzog, Maximilian, M. D., LL. D.	c/o Municipal Tuber. San., North Crawford and Bryn Mawr Sts., Chicago, Ill.	1916
Hess, Alfred F., M. D. (L, F)	16 West 86th St., New York City	1913
Heulings, Samuel M. (E)	605 West 112th St., New York City	1917
Hexter, Leo S.	21 East Blake Ave., Columbus, Ohio	1916
Heyne, David A.	5301 Larchwood Ave., W. Philadelphia, Pa.	1918
Hibbard, Mary E.	Linea 49 Vedado, Havana, Cuba	1912
Hickman, W. W., M. D.	Noxapater, Miss.	1916
Hidy, Klore Wm., M. D. (L)	*Address unknown*	1913
Higgins, Lafayette (E)	1144 West 25th St., Des Moines, Iowa	1913

Higley, Prof. G. O. (*F*)	244 North Washington St., Delaware, Ohio	1916
Hill, Carl Vernon, M. D.	Room 704, City Hall, Chicago, Ill.	1917
Hill, G. Everett (*E*)	45 Seventh Ave., New York City	1897
Hill, Herbert M., M. D. (*L*)	20 West Eagle St., Buffalo, N. Y.	1914
Hill, Herbert W., M. D. (*L, P, E*)	Institute of Public Health, London, Ont.	1896
Hill, James Sutcliffe, M. D.	Main St., Bellows Falls, Vt.	1916
Hill, Prof. John Edw.	Brown Univ., Providence, R. I.	1902
Hill, John W.	First Nat. Bank Bldg., Cincinnati, Ohio	1896
Hill, Nicholas S., Jr. (*L, E*)	100 William St., New York City	1910
Hiller, A. D., B. S.*	9 Jackson St., Newton Centre, Mass.	1917
Hilliard, Prof. C. M. (*F, L*)	298 Washington St., Wellesley Hills, Mass.	1911
Hindman, S. S., M. D.	615 Nicholas Bldg., Toledo, Ohio	1913
Hinds, M. E.	State Food & Drugs Lab., Nashville, Tenn.	1914
Hinman, Jack J., Jr. (*F*)	Lock Box 143, Iowa City, Iowa	1916
~~Hiram House, The~~	2723 Orange Ave., Cleveland, Ohio	1915
Hiscock, Ira V.	Yale Station, Box 984, New Haven, Conn.	1915
Hitchcock, John S., M. D.	160 Main St., Northampton, Mass.	1915
Hitchcock, H. E., M. D.	District Health Officer, 20 High St., Houlton, Me.	1918
Hitchens, A. Parker, M. D. (*L*)	Glenolden, Pa.	1907
Hixon, Jessie M.	104 Livingston St., Brooklyn, N. Y.	1915
Hoad, Prof. Wm. C. (*E*)	1037 Baldwin Ave., Ann Harbor, Mich.	1913
Hochstadter, Irving (*F*)	227 Front St., New York City	1915
Hodgetts, Chas. A., M. D. (*L, P, V*)	Conservation Commission, Ottawa, Ont.	1905
Hoffman, Charlotte, R. N.	Sanitarium St., Battle Creek, Mich.	1917
~~Hoffman, Frederick L., Ph. D. (*E, V*)~~	761 Broad St., Newark, N. J.	1907
Hoffman, George L., Ph. D.	321 Fourth St., Logansport, Ind.	1915
Hoffman, J. D. (*E*)	Purdue University, Lafayette, Ind.	1912
Holden, G. W., M. D. (*L, S*)	Agnes Memorial Sana., Denver, Colo.	1913
Holdredge, Leigh I.	*Address unknown*	1915
Hollis, Lawrence W., M. D.	10th and Chestnut Sts., Abilene, Tex.	1916
Holmes, Christian R., M. D.	10 East 8th St., Cincinnati, Ohio	1916
Holt, W. L., M. D. (*V, L, F*)	Medical School, Western Reserve Univ., Cleveland, Ohio	1914
Holway, Alvah S.	Beloit, Ohio	1915
~~Home Economics Dept.~~	Utah Agricultural Coll., Logan, Utah	1917
Hommon, Harry B. (*L, E*)	3d and Kilgour Sts., Cincinnati, Ohio	1910
Hood, Chas. H. (*F*)	494 Rutherford Ave., Boston, Mass.	1913
Hoover, C. B.	City Hall, Columbus, Ohio	1917
Hoover, Chas. P. (*L*)	Water Purification Works, Columbus, Ohio	1910
Hoover, Herbert C.	U. S. Food Administration, Washington, D. C. (Honorary)	1917
Hopkins, Erasmus G.	Glen Allen, Va.	1914
Horan, C. F.	Box 4, Watertown, Mass.	1915
Horowitz, Murray P. (*L, E*)	Dept. Biology and Public Health, Mass. Institute of Tech., Cambridge, Mass.	1914
Horton, Clarence W.	Health Officer, 36 Hampton St., Swampscott, Mass.	1917
Horton, Loton	524 West 57th St., New York City	1915
Horton, Theodore (*L, P, E*)	Chief Engr., State Dept. of Health, 206 Lancaster St., Albany, N. Y.	1912
Houghton, E. M., M. D. (*F, L*)	130 Longfellow Ave., Detroit, Mich.	1911
Howard, Charles D. (*F, E*)	State Lab. of Hygiene, Concord, N. H.	1913
Howard, Norman J.	Filtration Plant Lab., Dept. of Health, City Hall, Toronto, Ont.	1912
Howd, Salmon G., M. D.	153 Main St., Winsted, Conn.	1916
Howe, Eugene C.	Wellesley College, Wellesley, Mass.	1917
Howe, Frederick W.	State Normal School, Framingham, Mass.	1917
Howe, Wm. Augustus, M. D.	State Education Dept., Albany, N. Y.	1912
Howell. J. T., M. D.	Hartsville, S. C.	1917
Howell, Wm. O.	4310 Pine St., Philadelphia, Pa.	1915
Howk, Horace John, M. D.	Mt. McGregor, N. Y.	1915
Howland, C. A.	Inspective Engr., State Dept. of Health, Albany, N. Y.	1914
Hoxsie, B. K., Jr.	Sherwood, N. Y.	1915
Hoyne, Archibald L., M. D.	25 East Washington St., Chicago, Ill.	1917
Hoyt, Geo. E., M. D.	219 West Water St., Milwaukee, Wis.	1918
Hoyt, Robert N. (*L, P*)	City Health Office, Ramona Bldg., Palo Alto, Cal.	1913
Hubbard, Le Roy W., M. D. (*F*)	137 Primrose Ave., Mt. Vernon, N. Y.	1914
Hubbell, Clarence W.	2348 Penobscot Bldg., Detroit, Mich.	1915
Hudson, Jessie B., M. D. (*F*)	Carroll, Iowa	1912
Hudson, Walter G., M. D.	126 East 34th St., New York City	1917
Huebsch, Leo A., M. D.	State Sanatorium, Hamburg, Pa.	1915
Hull, Howard L., M. D.	State Dept. of Health, Harrisburg, Pa.	1916
Hull, Thomas G., Dr.	U. S. Food Administration, Washington, D. C.	1918
Hunt, Ralph H., M. D.	29 Harrison St., East Orange, N. J.	1914
Hunter, Henry G.	619 New Birke Bldg., Montreal, Que.	1914
Hunter John A.	Steam and Sanitary Engineer, American Sheet & Tin Co., Frick Bldg., Pittsburgh, Pa.	1918
Huntington, Homer I., S. B. (*F*)	U. S. P. H. S., Carlisle, Ark.	1916

Hurley, P. E., M. D.	160 Chestnut St., Holyoke, Mass.	1916
Hurd, Henry M., M. D.	1023 St. Paul St., Baltimore, Md.	1906
~~Hurty, J. N.,~~ M. D. (*P, E, V*)	29 East 2d St., Indianapolis, Ind.	1896
Hutchinson, Woods, M. D. (*P*)	Hotel Marseilles, 103rd St. and Broadway, New York City	1912
Hyde, Prof. Chas. G. (*E*)	California Univ., Berkeley, Cal.	1905
Hyde, Clarence L., M. D.	J. N. Adam Memorial Hosp., Perrysburg, N. Y.	1917
Iglesias, Manuel S. (*P*)	Vera Cruz, Mex.	1900
~~Illinois Manufacturers Association~~	76 West Munroe St., Chicago, Ill.	1916
Inches, J. W., M. D.	City Health Dept., Detroit, Mich.	1917
Ingham, E. A.	Mass. Institute of Tech., Cambridge, Mass.	1914
~~International Health Board~~	Rockefeller Foundation, 61 Broadway, New York City	1913
Irwin, Ralph E.	Pennsylvania Dept. of Health, Harrisburg, Pa.	1914
Izlar, A. L., M. D.	Ocala, Fla.	1914
Jackson, Daniel D. (*L, E*)	Columbia Univ., 116th St., New York City	1899
Jackson, Elmer C., M. D.	*Address unknown*	1913
Jackson, J. Frederick (*E*)	1174 Whitney Ave., Whitneyville, Conn.	1914
Jackson, James M., M. D.	1115 Ave. B., Miami, Fla.	1914
Jacobs, Philip P., Ph. D. (*S. V*)	105 East 22d St., New York City	1912
James, Linda B. A., C. P. H.	2 Divinity Ave., Cambridge, Mass.	1917
James, Walter B., M. D.	7 East 70th St., New York City	1915
Jameson, Heber C.	Prov. Lab., University of Alberta, Edmonton, Alberta	1916
Jameson, P. R.	R. F. D., Highland Ave., Brighton, N. Y.	1915
Jenkins, James, Jr.	69 Schermerhorn St., Brooklyn, N. Y.	1915
Jenkins, Park B., M. D.	Waubay, S. Dak.	1917
Jenks, Harry N. (*E*)	c/o Burma Mines Ltd., Namtu Northern Shan Sta., Burma, India	1917
Jennings, Annie B.	48 Park Ave., New York City	1915
Jennings, Fred H. (*L*)	1146 Boyd St., Watertown, N. Y.	1908
Jennings, Geo. H., M. D. (*F*)	Cor. Main and Wilson Sts., Jewett City, Conn.	1916
Jepson, S. L., A. M., Sc. D., M. D. (*V*)	Capitol Bldg., Charleston, W. Va.	1915
Jewell, Albert H. (*E*)	Signal Aviation School, Mt. Cummings, Mich.	1916
Joel, Ira D.	786 Orange St., New Haven, Conn.	1917
Johnson, Bertha F., M. D.	Box 765, Trenton, N. J.	1916
Johnson, E. B.	Room 216 Y. M. C. A., Montgomery, Ala.	1916
Johnson, E. Kingsland	Fisk Hill, N. Y.	1915
Johnson, Fred, M. D. (*P*)	501 Bellinger St., Eau Claire, Wis.	1914
Johnson, George A. (*L, E*)	150 Nassau St., New York City	1900
Johnson, Helen Louise (*F*)	415–416 Maryland Bldg., 1410 H St., N. W., Washington, D. C.	1915
Johnson, Ingrid	1615 Foster Ave., Chicago, Ill.	1913
Johnson, Loren, M. D.	2108 16th St., Washington, D. C.	1917
Jolls, Willard B., M. D.	Orchard Park, N. Y.	1915
Jone, Hugo (*L*)	P. O. Box 37, Station A, Brooklyn, N. Y.	1915
Jones, C. Hampson, M. D.	2529 St. Paul St., Baltimore, Md.	1915
Jones, E. A., M. D.	Cambridge, Md.	1915
Jones, F. G. (*L*)	c/o Ely Lilly Co., Greenfield, Ind.	1914
Jones, Granville R. (*L, E*)	Johns Hopkins Univ., Baltimore, Md.	1909
Jones, Prof. H. N. (*L*)	900 Ackerman Ave., Syracuse, N. Y.	1912
Jones, H. O., M. D., Ph. G.	2447 Indiana Ave., Chicago, Ill.	1917
Jones, Lyman A., M. D. (*P*)	Swampscott, Mass.	1910
Jones, Myron J. (*S*)	1779 Middlehurst Rd., Cleveland, Ohio	1914
Jones, Willard A., M. D. (*P*)	406 Physicians and Surgeons Bldg., Minneapolis, Minn.	1910
Jones, Wm. A., M. D.	142 Main St., Aurora, Ill.	1913
Jordan, Prof. Edwin O. (*L, F*)	University of Chicago, Chicago, Ill.	1899
Jordan, G. A., M. D.	City Division of Health, St. Louis, Mo.	1911
Jordan, Harry E. (*L, E*)	113 Monument Pl., Indianapolis, Ind.	1904
~~Jordan, Prof. James~~ O. (*L, P, F*)	1104 City Hall Annex, Boston, Mass.	1905
Jordan, Thomas, M. D. (*P*)	City Health Board, Boston, Mass.	1902
Joslin, Knight	U. S. N. Ass't Surgeon Royal, 129 Blackstone Blvd., Providence, R. I.	1916
Junkins, Walter H. (*V*)	20 Holland Ave., Westfield, Mass.	1917
Jurist, B. (*F, P*)	19 Park Pl., New York City	1904
Kastenhuber, E. G., Jr. (*E*)	P. O. Box 362, Easton, Md.	1912
Katz, Alfred	P. O. Box 1865, Ludlow, Mass.	1916
Kean, Jefferson R., M. D. (*P, V*)	1624 H St., N. W., Washington, D. C.	1909
Kebler, Lyman F., M. D. (*F*)	1322 Park Rd., N. W., Washington, D. C.	1917
Keister, Wm. S., M. D. (*F*)	Norton, Va.	1915
Keith, Simeon C., Jr. (*L*)	138 Lancaster Pl., Brookline, Mass.	1912
Kellerman, Karl F.	Bureau Plant Industry, U. S. Dept. Agriculture, Washington, D. C.	1907
Kellert, Ellis, M. D.	Bender Hygienic Lab., Albany, N. Y.	1915
Kelley, Eugene R., M. D. (*P, V*)	41 Egremont Rd., Coolidge Corner, Brookline, Mass.	1912
Kelley, Frank L., M. D.	2635 Etna St., Berkeley, Cal.	1916
Kelley, J. B., M. S. (*L, P*)	City Board of Health, Detroit, Mich.	1915

Kellogg, J. H., M. D. (*F*)	Battle Creek, Mich.	1878
Kenaston, H. R., M. D.	Bonesteel, S. D.	1913
Kendrick, Arthur	352 Western Ave., Brighton, Mass.	1912
Kennedy, John Payson, M. D. (*V, P*)	City Hall, Atlanta, Ga.	1909
Kennedy, Stephen R. M.	Blount Bldg., Penascola, Fla.	1914
~~Kentucky Agriculture Experiment Station (*F*)~~	Lexington, Ky.	1914
Kerr, John Walter, M. D. (*L*)	U. S. P. H. S., Washington, D. C.	1909
Kidder, Thomas F. (*P*)	State Health Board, Woodstock, Vt.	1907
Kiefer, Guy L. (*P*)	Detroit, Mich.	1907
Kilbourne, Chas. H. (*P, F*)	1476 Broadway, New York City	1912
Kilmartin, Thomas J., M. D.	City Hall, Waterbury, Conn.	1916
Kilmer, Fred B. (*F*)	147 College Ave., New Brunswick, N. J.	1906
Kimball, Chas. Campbell, M. D., Ph. D. (*F*)	301 Washington St., Watertown, N. Y.	1917
Kimball, D. D. (*E*)	15 West 38th St., New York City	1912
King, Myrtle E.	401 Court House, Minneapolis, Minn.	1916
King, W. E., M. D. (*L, P*)	Research Dept., Park Davis & Co., Detroit, Mich.	1910
Kinnaird, R. N.	833 West 15th St., Des Moines, Iowa	1915
Kinyoun, J. J., M. D. (*L, P*)	1423 Clifton St., N. W., Washington, D. C.	1902
Kirkbride, Mary B.	New York State Dept. of Health, 278 Yates St., Albany, N. Y.	1917
Kirkwood, R. C., M. D. (*I, S*)	Fort Bayard, N. Mex.	1915
Kirschbaum, Wm. G. (*V*)	New Bedford, Mass.	1915
Kistler, J. M., M. D.	148 Highland Ave., Minneapolis, Minn.	1913
Klein, Alvin W., M. D. (*P, E, F*)	West Hill, Riverdale, New York City	1909
Klein, Wm. I. (*E*)	313 Interstate Bldg., Kansas City, Mo.	1914
Kligler, Israel J., M. D. (*L, F*)	824 East 165th St., Bronx, N. Y.	1912
Kloser, Martin M., B. S.	City Board of Health, City Hall, Shreveport, La.	1917
Klotz, Oskar, M. D. (*L*)	Univ. of Pittsburgh, Pittsfield, Pa.	1912
Knight, I. W., M. D.	29 Grow Ave., Montrose, Pa.	1916
Knight, John G.	Plant City, Fla.	1914
Knope, S. A., M. D. (*P*)	16 West 95th St., New York City	1906
Knowles, Morris (*L, E*)	1200 B. F. Jones Law Bldg., Pittsburgh, Pa.	1901
Knowlton, Millard, M. D.	356 Commonwealth Ave., Boston, Mass.	1915
Knox, S. B. P., M. D.	914 Anacapa St., Santa Barbara, Cal.	1892
Kober, George M., M. D. (*P, V*)	1819 Q St., N. W., Washington, D. C.	1896
Koehler, G., M. D.	1116 Morse Ave., Chicago, Ill.	1915
~~Kopf, Edward W. (*S, V*)~~	1 Madison Ave., New York City	1913
Kress, Daniel H., M. D.	5 Pine Ave., Takoma Park, Washington, D. C.	1915
Krum, Harry J., (*F*)	Cor. Lawrence and Jefferson Sts., Allentown, Pa.	1916
Krumwiede, Charles, Jr., M. D. (*L*)	15 Hobart St., Bronxville, N. Y.	1914
Krusen, Wilmer, M. D.	127 North 20th St., Philadelphia, Pa.	1916
Kurk, Fred W.	Bact., Wilson & Co., 41st and Ashland Sts., Chicago, Ill.	1913
Kurtz, H. T., M. D. (*P*)	Highland Falls, N. Y.	1915
Kusel, George C., M. D. (*S, V*)	235 South 15th St., Philadelphia, Pa.	1913
Kutz, Sally E., B. A., M. Sc.	288 West 92d St., New York City	1917
LaChapelle, E. P., M. D. (*P, V*)	9 St. James St., Montreal, Que.	1887
Ladd, Henry A., M. D.	14 Beach St., Burlington, Vt.	1914
Lafreniere, Theodore J. (*E*)	9 St. James St., Montreal, Que.	1912
Lakeman, Curtis E. (*S, V*)	American Red Cross, Washington, D. C.	1914
Lambert, Edw. Allyn (*P*)	1089 Broad St., Bridgeport, Conn.	1915
Lambert, Henry F.	Batavia, N. Y.	1915
Lanahan, Joseph A., M. D.	161 Hamilton St., Albany, N. Y.	1915
Lancaster, H. M.	5 Queen's Park, Toronto, Ont.	1915
Landis, John H., M. D. (*P, E*)	6 Crescent Pl., Cincinnati, Ohio	1910
Lane, C. Guy, M. D.	36 Pleasant St., Woburn, Mass.	1914
Lang, S. E.	967 Grosvenor Ave., Winnipeg, Man.	1917
~~Lanza, A. J.,~~ M. D. (*I, S*)	Butte, Mont.	1916
~~Lappin, Richard C.~~	Bureau of the Census, Washington, D. C.	1912
Large, H. Lee, M. D.	Municipal Bldg., Rocky Mount, N. C.	1917
La Riew, F. J., M. D.	City Health Board, Washington, N. J.	1914
Larned, Sherwood J.	212 West Washington St., Chicago, Ill.	1917
Larson, Alfred (*L*)	515 Chicago Ave., Wausau, Wis.	1912
Larson, J. H.	105 East 22d St., New York City	1917
Latham, W. W.	Crockett, Tex.	1916
Lathrope, Thomas R. (*L, P*)	112 East 7th St., Little Rock, Ark.	1915
Latta, S. W., M. D.	233 South 4th St., Philadelphia, Pa.	1915
Laubaugh, Ernest E.	1122 East Jefferson St., Boise, Idaho	1914
Law, Edwin Augustus, M. D.	*Address unknown*	1914
Law, Robert, M. D.	190 Laurier Ave., E. Ottawa, Ont.	1915
Lawall, Chas. H. (*F*)	39 South 10th St., Philadelphia, Pa.	1914
Lawrence, Jos. S., M. D.	186 State St., Albany, N. Y.	1917
Laybourn, R. L., S. B., M. S.	543 Michigan Ave., Leavenworth, Kans.	1917
Lea, Richard S.	809 New Kirks Bldg., Montreal, Que.	1907
Leake, James P., M. D. (*L*)	Hygienic Lab., Washington, D. C.	1912

Leary, James H., M. D. (*P*)	Rush, N. Y.	1915
Leathers, Waller S. (*P*)	State Health Director, University, Miss.	1910
Le Bosquet, Maurice (*F*)	506 West 69th St., Chicago, Ill.	1910
Lebredo, Mario, M. D. (*L*)	San Jose 99 Altos, Havana, Cuba	1911
Ledbetter, B. A., M. D.	710 Maison Blanche Bldg., New Orleans, La.	1917
Lederer, Arthur, M. D. (*L*)	Dir., Hygienic Lab., Morgantown, W. Va.	1908
Ledyard, Edgar M. (*F*.)	Dir., Agricultural Dept., U. S. Smelting Co., Salt Lake City, Utah	1915
Lee, H. R., M. S.	6246 Cary Ave., College Hill, Cincinnati, Ohio	1917
Le Feber, John (*F*)	130–140 Eighth St., Milwaukee, Wis.	1913
Lehmkuhl, Henry W. (*F*)	226 14th St., Camp Upton, Long Island, N. Y.	1917
Lemmer, G. E., M. D.	153 Main St., Danbury, Conn.	1916
L'Engle, E. M., M. D.	2756 St. Johns Ave., Jacksonville, Fla.	1914
Lennon, George T. (*P*)	Haverhill, Mass.	1915
Le Prince, Joseph (*E*)	U. S. Marine Hospital, New Orleans, La.	1912
Leroy Y. Cassa, G., M. D. (*V*)	Calle 10 No. 14, Altos-Vedado, Habana, Cuba	1911
Levin, William, P. H., M. D. (*E*)	420 South Fifth Ave., Ann Harbor, Mich.	1917
Levine, Prof. Max (*L*)	Ames, Iowa	1914
Levy, E. C., M. D. (*L, P, V*)	Room 441, 30 Church St., New York City	1904
Lewinski-Corwin, E. H., Ph. D. (*S, V*)	17 West 43d St., New York City	1915
Lewis, Dwight M., M. D.	36 High St., New Haven, Conn.	1907
Lewis, Malcolm, S. B. (*V, I, L, F*)	102 North Hermitage Ave., Trenton, N. J.	1914
~~Lewis, Richard H., M. D.~~ (*V*)	Raleigh, N. C.	1892
Lewis, Prof. William E.	27 North 15th St., Allentown, Pa.	1916
Lewisohn, Adolph	61 Broadway, New York City	1915
Liber, Benzion, B. A., B. S., M. D.	61 Hamilton Pl., New York City	1916
~~Liceaga, Eduardo, M. D.~~	2A De Napoles Numeco 37, Mexico City, Mex.	1891
Lide, B. M., Jr.	2008 Pine St., St. Louis, Mo.	1917
Lieber, Conrad H.	3 Nutting Ave., Amherst, Mass.	1917
Light, A. L., M. D. (*E*)	Commissioner of Health, Dayton, Ohio	1914
Lindsay, Wm. Kinkade, M. D. (*P*)	1005 K St., Sacramento, Cal.	1913
Lipman, Wm. Henry, M. D. (*F*)	c/o Swift & Co., Union Stock Yards, Chicago, Ill.	1915
Lipman, Jacob G., Ph. D. (*L*)	Experiment Station, New Brunswick, N. J.	1910
Lippincott, Leon S., M. D. (*L, S, F*)	8 Noble St., Brunswick, Me.	1914
Lippitt, Wm. F., M. D.	San Juan, P. R. P. O. Box 1108	1915
Lippman, Marion H.	795 Sutter St., San Francisco, Cal.	1914
Lochridge, Elbert E.	Springfield, Mass.	1905
Locke, Elisabeth, R. N.	220 West 7th St., Cincinnati, Ohio	1916
Lockwood, R. Fred, M. D.	1099 Warwick Ave., Lakewood, R. I.	1917
Loeb, Benjamin W. (*F*)	25 North 11th St., Reading, Pa.	1914
Long, Alfred G., M. D. (*L, F*)	State Board Health Lab., Mankato, Minn.	1909
Long, D. J., M. D.	Piedmont, W. Va.	1916
Long, E. F., M. D.	Lexington, N. C.	1917
Long, Walter S. (*F*)	1116 Mississippi St., Lawrence, Kans.	1915
Longfellow, Robert C., M. D. (*L, E, F*)	1611 Twenty-Second St., Toledo, Ohio	1910
Longley, Francis F. (*L, P*)	42d St. Bldg., New York City	1906
Looney, R. N., M. D.	Prescott, Ariz.	1913
Lord, Mrs. Frederick T.	305 Beacon St., Boston, Mass.	1912
Lorini, Raffaele, M. D.	Hotel Del Coronado, Coronado Beach, Cal.	1917
Lowe, D. B., M. D.	Dept. 38, B. F. Goodrich Co., Akron, Ohio	1915
Lougee, Lester B., M. D.	*Address unknown*	1915
Lounsbury, Wm. C. (*P*)	1518 Tower Ave., Superior, Wis.	1910
Love, R. W., M. D.	Moorefield, W. Va.	1916
Lowe, Wm. Herbert, D. V. S.	117 Trenton Ave., Paterson, N. J.	1906
Low, Chas. E., M. D.	City Hall, Spartanburg, S. C.	1917
Lowry, Elizabeth C., R. N.	1933 Mercer St., Princeton, W. Va.	1917
Lowther, Burton	3121 Park Ave., Kansas City, Mo.	1914
Lucia, Mildred H., R. N.	Mt. Washington Sanatorium, Eau Claire, Wis.	1916
Luckett, George S., M. D. (*F*)	Cavanaugh Courts, Washington, D. C.	1917
Ludlow, David H., M. D.	244 Spring Garden St., Easton, Pa.	1915
Ludlow, J. L. (*E*)	State Health Board, Winston-Salem, N. C.	1903
Ludlum, L. C., M. S. (*F*)	192 Ford Ave., Highland Park, Mich.	1916
Ludwig, Ernest*	The Leader-News Bldg., Cleveland, Ohio	1915
Luening, Fred W.	663 Forty-Ninth St., Milwaukee, Wis.	1914
Lummis, G. D., M. D.	501 South Main St., Middletown, Ohio	1916
Lumsden, Leslie L., M. D. (*L*)	Hygienic Lab., U. S. P. H. S., Washington, D. C.	1909
Laurie, G. A.	Boston Dispensary, Boston, Mass.	1917
Luster, Robert D., M. D. (*P*)	Granite City, Ill.	1914
Lyall, Harold Wm., Ph. D. (*L, E*)	Research Antitoxin Lab., Otisville, N. Y.	1910
Lyle, Josephine I. (*F*)	306 East Marnill St., Lexington, Ky.	1915
Lyman, Francis R., M. D. (*P*)	Broadway, Hastings-on-Hudson, N. Y.	1915
Lynch, Chas. F., M. D. (*I*)	12 South Clark St., Chicago, Ill.	1916
Lynch, Kenneth M., M. D.	Medical College of the State of South Carolina, Charleston, S. C.	1918
Lyon, E. De M., M. D.	910 South St., Peekskill, N. Y.	1917

Lyster, Major Wm. John	649 Jefferson Ave., Detroit, Mich.	1913
~~Lythgoe, Hermann C.~~ (*F*)	538 State House, Boston, Mass.	1917
Lytle, Harry A. R.	San 1, Nutana P. O. Saskatoon, Sask.	1917
McBrayer, L. B. (*P, S, F*)	Supt. State Tuberculosis Sanitarium, Sanatorium, N. C.	1914
McBride, J. S., M. D.	Public Safety Bldg., Seattle, Wash.	1916
McBryde, C. N., M. D. (*L, F*)	Dept. of Agriculture, Washington, D. C.	1910
McCaustland, E. J.	Dean, School of Engineering, University of Missouri, Columbia, Mo.	1914
McClenahan, Daniel A. (*F*)	204 Herkimer St., Hamilton, Ont.	1912
McClintock, Chas. T., M. D.	Saresota, Fla.	1908
McClintock, George	Overbrook, Kans.	1914
McCluer, Margaret	Bon Air, Va.	1917
McCollum, Prof. E. V.	Johns Hopkins Medical School, Baltimore, Md.	1917
McCombs, Carl E., M. D.	Bur. of Mun. Res., 261 Broadway, New York City	1917
McCormack, A. T., M. D.	1144 State St., Bowling Green, Ky.	1917
McCormack, Eliz.	Mem. Fund, 315 Plymouth Court, Chicago, Ill.	1915
McCormick, John J., M. D.	15 Burnett St., Woburn, Mass.	1917
McCormick, L.	Asheville, N. C.	1915
McCoy, George W., M. D. (*L*)	Hygienic Lab., Washington, D. C.	1917
McCrady, Mac H.	9 St. James St., Montreal, Que.	1915
McCrudden, James F. (*P, E*)	5914 Pulaski Ave., Germantown, Philadelphia, Pa.	1914
McCuistion, Ed. H. (*F*)	136 North 18th St., Paris, Tex.	1916
~~McCullough, John W~~. S., M. D.	Parliament Bldgs., Toronto, Ont.	1912
McCurdy, Sidney, M. D.	Youngstown Sheet & Tubing Co., Youngstown, Ohio	1915
McDonald, J. Oliver, M. D.	190 West State St., Trenton, N. J.	1916
McDonell, Wm. W., M. D.	City Eng. Bldg., Jacksonville, Fla.	1917
McDonnell, Milton E., M. D. (*L*)	2629 Broad Ave., Altoona, Pa.	1910
McDougal, Luther L., B. S., M. D.	Morton Bldg., Bonneville, Miss.	1916
McDowell, Major John R., M. O. R. C.	Ohio State Health Dept., Columbus, Ohio	1915
McGee, Harold G. (*E*)	Lucas County Sanitary Engineering Dept., Toledo, Ohio	1915
McGill, Anthony (*L*)	317 Queen St., Ottawa, Ont.	1910
McGill, Patrick G., M. D. (*P*)	1202 Tower St., Superior, Wis.	1909
McGinnis, R. H., M. D. (*S*)	501 Laura St., Jacksonville, Fla.	1914
McGlenen, E. W. (*V*)	103 City Hall Annex, Boston, Mass.	1912
McGregor, Tracey W.	239 Brush St., Detroit, Mich.	1915
McGuire, Stuart, M. D.	513 East Grace St., Richmond, Va.	1909
~~McGurren, C. J.~~, M. D., C. M.	Devils Lake, N. Dak.	1917
McInerney, T. T.	Ithaca, N. Y.	1915
McKay, Lt. W. G., M. R. C. (*L*)	Ft. Oglethorpe, Ga.	1911
McKee, C. E.	Murchison Bldg., Wilmington, N. C.	1917
McKee, Mark T. (*S*)	937 Dime Bank Bldg., Detroit, Mich.	1915
McKinlay, John F. (*P*)	233 St. Antoine St., Detroit, Mich.	1915
~~McLaughlin~~, Allan J., M. D. (*L*)	State Health Dept., Boston, Mass.	1912
McLaughlin, George E., M. D. (*L*)	41 Crescent Ave., Jersey City, N. J.	1901
McLaughlin, Thomas J., M. D.	108 Main St., Woonsocket, R. I.	1917
McLean, Ephraim R., M. D. (*F*)	Cleveland, Miss.	1916
McLean, F. H. (*S*)	130 East 22d St., New York City	1912
McLellan, E. A., M. D.	105 Park St., Bridgeport, Conn.	1916
McNair, J. C., M. D.	Fayette, Miss.	1916
McNally, Thomas J., M. D.	22 Oxford St., Guelph, Ont.	1912
McNeil, Archibald, M. D. (*L*)	85 Rockledge Ave., White Plains, N. Y.	1914
McRae, Henry C. (*L, E*)	306th Engrs., Camp Jackson, Columbia, S. C.	1907
McShane, John J., M. D. (*P*)	City Hall, Akron, Ohio	1915
McSweeney, Edw. F.	40 Central St., Boston, Mass.	1915
Mackler, M. J.	1038 Boylston St., Boston, Mass.	1917
Macknight, Adam S., M. D.	355 North Main St., Fall River, Mass.	1915
Mac Leod, Norman M., M. D.	6 Powell Ave., Newport, R. I.	1917
Macy, Harold (*F*)	Bact., N. Y. Experiment Sta., Geneva, N. Y.	1917
Mahady, Charles R., M. D.	223 North Washington St., Rome, N. Y.	1917
Mahnken, A. J., C. E.	52 Hudson Pl., Weehawken, N. J.	1917
Mahoney, Francis X., M. D. (*V*)	701 Columbia Rd., Boston, Mass.	1912
Mahoney, John Joseph, M. D.	401 Lafayette St., Jamestown, N. Y.	1915
Makepeace, George D.	Kirtland Pumping Station, East 49th St., Cleveland, Ohio	1916
Malaret, Pedro, M. D.	Box 213, Ponce, P. R.	1915
Mallalieu, Willard C.	155 Harrison Ave., Jersey City, N. J.	1916
Maloney, Leona	68 Prospect St., Fall River, Mass.	1917
Maloney, Paul J., M. D.	Cornwall, Ont.	1912
Manchester, Hiram L., M. D.	Pawlet, Vt.	1916
Mandel, Arch M. (*F*)	100 Griswold St., Detroit, Mich.	1917
Manheimer, W. A., Ph. D.	2350 Davidson Ave., New York City	1914
Mann, A. L., M. D. (*F*)	392 East Chicago, St., Elgin, Ill.	1916
Mann, Frank H.	105 East 22d St., New York City	1915
Mann, Kristine, M. A., M. D.	251 West 100th St., New York City	1917
Manning, Wm. J., M. D.	1113 N St., N. W., Washington, D. C.	1909

Mantel, F. A., B. A.	Court House, Memphis, Tenn.	1918
Many, Charles W., M. D.	1st Lt., M. R. C. U. S. Army, Florida, N. Y.	1917
Marcussen, Wm. H. (*L, F*)	99 Main St., Binghamton, N. J.	1913
Mark, Mary Louise (*F*)	Dept. Economics and Sociology, Ohio State Univ., Columbus, Ohio	1915
Marks, Jeanette (*F, S*)	The President's House, South Hadley, Mass.	1914
Marsh, Henry Wm., M. D.	P. O. Box 75, Solomons, Md.	1915
Marshall, Prof. Charles E. (*F, L*)	44 Sunset Ave., Amherst, Mass.	1901
Martin, James C., M. D.	28 Gerald Ave., Highland Park, Mich.	1916
Martin, W. F., M. D.	Battle Creek, Mich.	1917
Marx, Prof. C. D.	Stanford University P. O., Cal.	1918
Maslon, Morris, M. D. (*I, S*)	3 Lincoln Ave., Glens Falls, N. Y.	1915
Mason, William P. (*L*)	Troy, N. Y.	1905
Massie, James A., M. D.	Lincoln and Marcy Sts., Santa Fe, N. Mex.	1917
Master, Melvin F., B. S. (*F*)	Milk Dept., City Hall, Lowell, Mass.	1917
Mathers, John M.	Bureau of Sanitation, City Health Department, Akron, Ohio	1914
Matthews, L. A. (*L*)	100 Valley Rd., Montclair, N. J.	1915
Mattison, Fitch C. E. (*P*)	City Chamber of Commerce, Pasadena, Cal.	1910
Mayhugh, I., M. D.	Barstow, Tex.	1916
Mead, Daniel W. (*E*)	530 State St., Madison, Wis.	1892
Meader, Fred Marlin, M. D. (*L, V*)	State Health Dept., Albany, N. Y.	1912
Meader, Percy D. (*L*)	Arnold Lab., Brown Univ., Providence, R. I.	1915
Mears, E. N. K., M. D.	Schuylerville, N. Y.	1915
Mebus, C. F. (*E, F*)	908 Land Title Bldg., Philadelphia, Pa.	1912
Mebus, P. E. (*E*)	5425 Whitby Ave., Philadelphia, Pa.	1917
Meeker, Royal (*I, F*)	Bureau of Labor Statistics, Washington, D. C.	1915
Meigs, Grace L., M. D.	Children's Bureau, U. S. Dept. of Labor, Washington, D. C.	1916
Melvin, Alonzo D., M. D. (*P*)	1751 Park Rd., Washington, D. C.	1910
Mendenhall, Dorothy Reed, M. D.	510 North Carroll St., Madison, Wis.	1917
Mendez, Arturo, M. D.	San Luis Potosi, Mexico	1906
Mercur, Wm. Henry, M. D. (*P, E, S, F*)	Fifth Ave. and St. James St., Pittsburgh, Pa.	1912
Merrill, Theodore C., Ph. B., M. D. (*F*)	1744 Columbia Rd., Washington, D. C.	1916
Messer, Richard (*E*)	1110 Capitol St., Richmond, Va.	1911
Metcalf, Arthur A., M. D.	300 Superior Ave., Crystal Falls, Mich.	1916
~~Metropolitan Life Ins. Co., Corporate~~	1 Madison Ave., New York City	1915
Meyer, Emanuel M.	1329 Locust St., Cincinnati, Ohio	1916
Meyer, Frank I., B. S.	270 Broad St., Newark, Ohio	1918
~~Michigan, Secretary State Health Board~~	Lansing, Mich.	1915
Mickle, F. Lee (*L, F*)	State Dept. of Health, 135 Huntington Ave., New Haven, Conn.	1914
Miles, R. E. (*S*)	Hartman Bldg., Columbus, Ohio	1912
Miller, Chas. Scott, M. D.	1218 Wyoming Ave., Philadelphia, Pa.	1916
Miller, Edgar C. L., M. D. (*L*)	Atascadero, Cal.	1908
Miller, K. E., M. D.	Ass't Surg., Tarboro, N. C.	1917
Miller, L. A., M. D. (*S*)	432 Colorado Ave., Colorado City, Colo.	1913
Miller, Moses J., M. D.	City Health Laboratories, City Hall, Cleveland, Ohio	1917
Miller, Oliver J., M. D. (*P*)	People's Bank Bldg., Sanford, Fla.	1914
Mills, Dudley A.	*Address unknown* (Honorary)	1905
Mills, Robert E., M. A.	Dept. of Public Health, Toronto, Ont.	1917
Mills, Wm. Wirt	249 Manor Rd., West New Brighton, N. Y.	1910
Miner, Carl S.	344 St. Palos St., Glencoe, Ill.	1917
Mitchel, E. W.	P. O. Box 376, Ancon, C. Z.	1915
Mitchell, Harold H., M. D.	Canisteo, N. Y.	1916
~~Mitchell, Henry, M. D.~~	Daytona Beach, Fla.	1886
Mitchell, John P. (*I, E*)	Stanford Univ., Cal.	1909
Mitchener, James Samuel, M. D.	Kinston, N. C.	1918
Moat, C. P. (*L, F*)	State Health Board, Burlington, Vt.	1903
Mock, Harry E., M. D.	5234 Thirty-Ninth St., Washington, D. C.	1915
Mohler, John R. (*L*)	1620 Hobart St., N. W., Washington, D. C.	1914
Mohr, Charles A., M. D.	252 St. Anthony St., Mobile, Ala.	1915
Molloy, Daniel M., M. D.	*Address unknown*	1914
Molloy, Wm. J., M. D. (*P*)	310 South Mulberry St., Muncie, Ind.	1913
Moncrieff, John T., M. D. (*F*)	1250 Broad St., Columbus, Ga.	1913
Monfort, Wilson F. (*E*)	506 North Vandeventer Ave., St. Louis, Mo.	1908
Monger, John E., M. D. (*V*)	Wyandolle Bldg., Columbus, Ohio	1917
Monjaras, Jesus E., M. D. (*L, P, V*)	Calle De Ezequiel, Montes No. 15, Mexico City, Mex.	1891
Montilla, F.	Ayuntamiento Bldg., San Juan, P. R.	1915
~~Montizambert~~, Frederick, M. D. (*P*)	Dept. Agriculture, Langevin Block, Ottawa, Ont.	1885
Moor, Frederick C.	Telephone Bldg., Tallahassee, Fla.	1914
Moore, John A., M. D. (*P*)	Main St. and Park Ave., Millerton, N. Y.	1914
Moore, Philip N.	3125 Lafayette Ave., St. Louis, Mo.	1915
Moore, T. V., M. D. (*V*)	Lewisohn Bldg., Butte, Mont.	1915
Moore, V. A., M. D. (*L, F*)	Veterinary College, Ithaca, N. Y.	1896
Morey, George C., M. D.	Remsen, N. Y.	1915
Morgan, H. G., M. D. (*F*)	3d Floor City Hall, Indianapolis, Ind.	1915
Morgan, Ralph R., B. S. (*F*)	Y. M. C. A., Petersburg, Va.	1917

Morgan, John W., M. D.	85 South Penn St., Denver, Colo.	1913
Morrill, Ashley B., M. D., S. B.	4669 Lake Park Ave., Chicago, Ill.	1917
Morris, Agnes	New Court Bldg., New Orleans, La.	1916
Morris, S. Poulterer (*S*)	State Capitol, Denver, Colo.	1912
Morse, Robert B.	16 West Saratoga St., Baltimore, Md.	1915
Morse, Col. W. F. (*E*)	90 West St., New York City	1912
Mosely, J. M., M. D.	Arcadia, La.	1917
Mott, Wm. E. (*P, E*)	842 Sheridan Ave., Pittsburgh, Pa.	1910
Mouquin, Louis H. F.	273 West End Ave., New York City	1916
Mudge, Courtland S.	1328 Fairmont St., N. W., Washington, D. C.	1913
Mueller, Hugo, M. D.	Gen. Hospital, Cincinnati, Ohio	1916
Muhlberg, Wm., M. D.	Box 892, Cincinnati, Ohio	1916
Mulcahey, John V. (*L*)	17 Eastfield Ave., Trenton, N. J.	1907
Muldowney, Mary M.	363 Quail St., Albany, N. Y.	1915
Mulford, H. K.	412 South 13th St., Philadelphia, Pa.	1896
Mull, Edgar P.	c/o Allen Filter Co., Toledo, Ohio	1910
Mullin, R. H., M. D. (*L*)	Vancouver General Hospital, Vancouver, B. C.	1911
Mullowney, John J., M. D.	5506 Green St., Philadelphia, Pa.	1913
Munford, Samuel A., M. D.	317 College Ave., Ithaca, N. Y.	1915
Murphey, Eugene Edmund, M. D.	452 Telfair St., Augusta, Ga.	1914
Murphy, Anthony M., M. D. (*P*)	City Hall, La Crosse, Wis.	1910
Murphy, A. R.	137 Centre St., New York City	1916
Murphy, Ignatius J. (*F*)	Minnesota Public Health Ass'n, St. Paul, Minn.	1914
Murphy, John M., M. D.	601 West Division St., Lincoln Park Sta., Chicago, Ill.	1914
Murphy, Lyman C. (*L*)	City Hall, Chicago, Ill.	1913
Murray, E. W., M. D.	91 Washington Ave., Newark, N. J.	1917
Murray, T. Aird (*E*)	186 King St. West, Toronto, Ont.	1915
Murray, Joseph I. (*F*)	Crescent Creamery Co., Winnipeg, Man.	1915
Murray, Prof. T. J. (*L, E*)	Agricultural Experiment Station, Blacksburg, Va.	1916
Murray, Wm. K.	1224 East 53d St., Chicago, Ill.	1916
Musgrave, Wm. E., M. D.	Philippine General Hospital, Manila, P. I.	1915
Nagle, John T., M. D.	2 East 127th St., New York City	1874
~~National Board Y. W. C.~~ A.	600 Lexington Ave., New York City	1912
National Organization for Public Health Nursing	600 Lexington Ave., New York City	1913
Naulty, Charles W., Jr., M. D.	U. S. Quarantine, Perth Amboy, N. J.	1915
Naumann, H. T. G., M. A.	1024 Eighth St., Port Huron, Mich.	1917
Neagle, H. B., M. D.	33 Algonquin St., Dorchester, Mass.	1917
Neff, Joseph S., M. D. (*P, V*)	Narberth, Pa.	1897
Nelbach, George J. (*S*)	105 East 22d St., New York City	1912
Nelson, Charles A.	420 Twentieth St., North, Minneapolis, Minn.	1916
Nelson, J. Bernard, Ph. B., M. D.	P. O. Box 262, Mesa, Ariz.	1917
Nelson, N. A.	c/o Cincinnati Anti-Tuber. League, 209 West 12th St., Cincinnati, Ohio	1915
Nesbitt, Chas. T., M. D. (*E, S, V*)	415 South Front St., Wilmington, N. C.	1913
Nevin, Mary	State Lab., Dept. of Health, Albany, N. Y.	1915
New Jersey State Health Board	Trenton, N. J.	1915
Newell, C. R. (*L*)	Box 63, Kewanee, Ill.	1914
Newlands, James A. (*L, E*)	11 Laurel St., Hartford, Conn.	1907
Newman, G. A., M. D.	c/o Prison Hosp., Stillwater, Minn.	1899
New York Department of Health	New Rochelle, N. Y.	1915
Nice, Paul S.	312 Seventeenth St., Denver, Colo.	1918
Nichols, John D. (*F*)	7100 Clark Ave., Cleveland, Ohio	1914
Nichols, Paul F., S. B.*	Camp Devens, Mass.	1917
Nichols, M. Starr (*F*)	625 North Henry St., Madison, Wis.	1916
Nichols, Nelson E., M. D.	657 Congress St., Portland, Me.	1911
Nickerson, J. F. (*F*)	431 South Dearborn St., Chicago, Ill.	1912
Nicol, Norman C. (*E*)	*Address unknown*	1913
Nicoll, Annetta	Chief Food Inspector, City Hall, Topeka, Kans.	1918
Nicoll, Mattias, Jr., M. D.	State Dept. of Health, Albany, N. Y.	1917
Nisbet, Verner, M. D.	Ambler, Pa.	1915
Noble, Robt. E.	Major M. C., U. S. Army, War Dept., Washington, D. C.	1915
Noland, Lloyd, M. D. (*P, S*)	Supt. Dept. of Health, Tenn. Coal Iron & R. R. Co., 1224 Brown-Marx Bldg., Birmingham, Ala.	1913
Nolte, August G. (*L*)	4212 Red Bud Ave., St. Louis, Mo.	1914
Norcross, P. H. (*E*)	1622 Candler Bldg., Atlanta, Ga.	1917
Normandin, Louis Z., M. D.	City Board of Health, New Bedford, Mass.	1917
Norment, Richard B., Jr., M. D.	310 Arcade Bldg., Hagerstown, Md.	1916
North, Charles E., M. D. (*L, P, F*)	30 Church St., New York City	1908
Norton, Arthur C., M. D.	H. O., Middletown Springs, Vt.	1916
Norton, George H., C. E. (*E*)	7 Municipal Bldg., Buffalo, N. Y.	1913
Norton, John F., Ph. D. (*L, F*)	Dept. of Bacteriology, University of Chicago, Chicago, Ill.	1912
Nowell, H. W., M. D. (*F*)	535 Beacon St., Boston, Mass.	1917
Noxon, G. H., M. D. (*S, F*)	Main and Gracious Sts., Darien, Conn.	1916

Nuebling, Emil L. (*E*)	25 North 11th St., Reading, Pa.	1912
Nydegger, J. A., A. M., M. D., Sc. D	University Club, Baltimore, Md.	1917
Nygren, Werner (*I*)	Consulting Engr., 101 Park Ave., New York City	1917
Oakman, Carl S., M. D. (*F*)	22 Locust St., Detroit, Mich.	1914
Ober, Eugene Geo., M. D. (*F*)	632 Kossuth St., Bridgeport, Conn.	1916
Obert, B. H.	709 Asbury Ave., Asbury Park, N. J.	1914
O'Brien, Henry R.	412 Camden Ct., Ann Harbor, Mich.	1914
Obst, Maud Mason (*L*)	Coatesville, Pa.	1915
O'Donnell, George T., M. D	768 Main St., Waltham, Mass.	1917
O'Donnell, Prof. R., C. E	119 South Atherton St., State College, Pa.	1918
Ogden, Prof. H. N. (*E*, *S*)	614 University Ave., Ithaca, N. Y.	1912
Ohage, Justus, M. D	5th and Cedar Sts., St. Paul, Minn.	1915
O'Leary, A. P., M. D	Bigtimber, Mont.	1916
Olin, Richard M.	Michigan State Board of Health, Lansing, Mich.	1917
Oliver, Edward B., M. D., C. M.	City Hall, Fort William, Ont.	1917
O'Maley, J. M., M. D	Pike and Main St., Covington, Ky.	1916
O'Mara, Ella Anna	313 Abercorn St., Savannah, Ga.	1914
O'Neill, John H. (*L*, *E*)	936 Aribella St., New Orleans, La.	1914
Orenstein, A. J., M. D. (*E*, *S*)	P. O. Box 1056, Johannesburg, S. Africa	1912
Osborn, Howard G.	City Hall, East Chicago, Ind.	1918
Osborn, Stanley H., M. D	19 Agassiz St., Cambridge, Mass.	1914
Osborne, Frank J. (*S*)	19 Hillyer St., Orange, N. J.	1913
Osborne, I. S. (*E*)	957 Rose Bldg., Cleveland, Ohio	1916
Ostheimer, Maurice, M. D	2202 De Lancey Pl., Philadelphia, Pa.	1915
Otis, Edward O., M. D. (*F*)	381 Beacon St., Boston, Mass.	1894
Overton, Frank, M. D	Patchogue, N. Y.	1912
Owen, Edward B., M. D. (*S*)	402 West Main St., Merrill, Wis.	1913
Owen, Wm. O., M. D	2719 Ontario Rd., Washington, D. C.	1910
Owens, Robert B.	Edmonton, Alta.	1908
Paddock, Eugene H., C. E	1825 F St., N. W., Washington, D. C.	1917
Page, B. W., M. D	Court House, Lumberton, N. C.	1915
Page, Calvin G., M. D. (*L*, *F*)	128 Marlborough St., Boston, Mass.	1914
Page, J. D., M. D	P. O. Sans Bruit, Quebec, Que.	
Paine, Liston, M. D	Box 366, San Juan, P. R.	1915
Palardy, Hector, M. D., D. P. H. (*F*)	81 Chelsea Rd., Hull, Que.	1916
Palmer, George Thomas, M. D	628 East Capitol Ave., Springfield, Ill.	1917
Palmer, George T. (*L*)	10 Edgemont St., Roslindale, Mass.	1911
Palmer, Wm. B. (*V*, *L*, *F*)	Health Dept., Orange, N. J.	1916
Pannenborg, Arthur, M. D	89 Seventeenth St., Chicago Heights, Ill.	1916
Paquin, J. A.	1304 Acushnet Ave., New Bedford, Mass.	1916
Park, Wm. E., M. D. (*P*)	1246 East State St., Rockford, Ill.	1912
Park, Wm. H., M. D. (*L*, *F*)	315 West 76th St., New York City	1899
Parker, Henry F., M. D	9 Village Ave., Rockville Center, N. Y.	1915
Parker, Francis L., M. D. (*L*, *E*)	40 Broad St., Charleston, S. C.	1917
Parker, H. Godwin (*V*, *F*)	701 Crawford St., Portsmouth, Va.	1917
Parker, Horatio N. (*L*, *F*)	*The Delineator*, Butterick Bldg., New York City	1900
Parnall, Christopher G., M. D	Municipal Bldg., Jackson, Mich.	1915
Parramore, James B., M. D	341–342 St. James Bldg., Jacksonville, Fla.	1915
Parry, Eleanor, M. D. (*F*)	Box 422, Huntington, N. Y.	1901
Parsons, Payne B. (*L*)	Dept. of Agriculture, Bureau of Chemistry, Washington, D. C.	1915
Parsons, Robert (*L*, *F*)	508 West 114th St., New York City	1915
Pastene, Albert A., M. D	Box 32, Chester, Mont.	1916
Patchin, Charles V.	66 Elizabeth St., Dansville, N. Y.	1915
Paterson, Robert G., Ph. D. (*S*)	Room 15, 83 South 4th St., Columbus, Ohio	1916
Patten, Jane B.	Elm Brook, South Natick, Mass.	1914
~~Patterson, Francis D., M.~~ D	506 Kunkel Bldg., Harrisburg, Pa.	1913
Patterson, Harold A., M. D	116 Goodell St., Buffalo, N. Y.	1917
Paul, George P., M. D	c/o Principal Medical Officer, Suva, Fiji	1915
Pearl, Corice C.	35 Benedict Ave., Norwalk, Ohio	1916
Pearl, Raymond, M. D	3114 Sixteenth St., N. W., Washington, D. C.	1917
Pearse, Langdon (*E*)	5435 Hyde Park Boulevard, Chicago, Ill.	1910
Pearson, Raymond A.	Pres. Iowa State College, Ames, Iowa	1917
Pearson, Wallace M.	Water Chemist, 1005 Beogle St., Flint, Mich.	1917
Pease, H. D., M. D. (*L*, *E*, *F*)	39 West 38th St., New York City	1897
Peck, Evelyn	130 East 22d St., New York City	1917
Peck, F. H., M. D. (*F*)	80 Beekman St., New York City	1916
Peebles, A. R., M. D	1600 Hillside Rd., Boulder, Colo.	1914
Pendleton, Helen B.	c/o Associated Charities, 13 Central Ave., Newark, N. J.	1914
Perkins, Edmund T., M. A., C. E.	1210 38 South Dearborn St., Chicago, Ill.	1916
Perkins, Roger G., M. D. (*L*)	Western Reserve Medical School, Dept. of Hygiene, Cleveland, Ohio	1902
Perrow, Mosby G. (*L*, *P*, *F*)	1100 Federal St., Lynchburg, Va.	1908

Perry, Edw. R., M. D.	510 Commercial St., Raymond, Wash.	1917
Perry, F. C., M. D.	210 Laura St., Jacksonville, Fla.	1914
Perry, Arthur Reed, M. D. (*I, S, V*)	1624 Lamont St., Washington, D. C.	1913
Perry, Frank, M. D.	Main and Maple Sts., Norwood, Ohio	1916
Perry, J. C., M. D.	U. S. P. H. S., Ellis Island, N. Y.	1903
Peter, W. W., M. D.	122 Wellington Hill St., Mattapan, Mass.	1916
Peters, Arthur O.	705 Reibold Bldg., Dayton, Ohio	1915
Peters, Wm. H.	3169 Vine St., Cincinnati, Ohio	1913
Peterson, William F., M. D.	Army Medical School, Washington, D. C.	1917
Petrie, Wm. F. (*V*)	1025 Ionia St., W., Lansing, Mich.	1914
Phelps, Earle B., M. D. (*L, E*)	Hygienic Lab., U.S. P. H. S., Washington, D. C.	1902
Philbrick, Burton G. (*L, F*)	16 Ocean Ave., Salem, Mass.	1908
Philippine Health Service	Manila, P. I.	1915
Philips, Asa Emory (*E, F*)	2117 Le Roy Pl., Washington, D. C.	1912
Pickel, Oscar C.	Box 919–920, Antofagasta, Chile	1913
Pickett, Wm. H. (*P*)	City Health Office, Gainesville, Fla.	1914
Pierson, Ruth Ogden, B. A. (*F*)	The American Red Cross, Sanitary Unit No. 12, City Bldg., Chillicothe, Ohio	1917
Pincus, Sol (*L, I, E*)	Hygienic Laboratory, Washington, D. C.	1916
Plagge, Irwin Fred Willard	Deerfield, Ill.	1917
Plant, John W., M. D.	1013 West Ionia St., Lansing, Mich.	1917
Platt, Philip S. (**P, S*)	105 East 22d St., New York City	1914
Pleadwell, Frank L., M. D. (*V*)	Medical Inspector, U. S. Navy Yard, Norfolk, Va.	1909
Plecker, Walter A., M. D. (*V*)	1110 Capitol St., Richmond, Va.	1914
Plummer, Charles G., M. D. (*F*)	465 East South Temple St., Salt Lake City, Utah	1915
Poling, J. A., M. D. (*P, F*)	Old Colony Bldg., Freeport, Ill.	1911
Pollock, Horatio M., Ph. D. (*V*)	447 Manning Blvd., Albany, N. Y.	1917
Pomeroy, C. T. (*L*)	109 East 5th St., Atlanta, Ga.	1911
Pomeroy, J. L., M. D.	358 Court House, Los Angeles, Cal.	1915
Poor, Daniel W. (*L*)	27 Ridge St., Orange, N. J.	1915
Porter, F. B., M. D.	P. O. Box 1008, Fort Worth, Tex.	1912
Porter, John L., M. D. (*L*)	840 Panola St., New Orleans, La.	1902
Porter, Joseph Y., Jr., M. D. (*L, V*)	Key West, Fla.	1911
Porter, Joseph Y., M. D.	State Health Officer, Jacksonville, Fla.	1878
Porter, George D., M. D.	162 Crescent Rd., Toronto, Ont.	1915
Porter, S. D., M. D. (*P*)	Box 18, R. F. D. No. 2, Baton Rouge, La.	1911
Porvin, Edward C., M. D.	301 East Fordham Rd., New York City	1914
Pottenger, Francis M., M. D.	Monrovia, Cal.	1911
Potter, Alexander	50 Church St., New York City	1914
Potts, Clyde (*E*)	30 Church St., New York City	1907
Powell, Robert C.	1301 North Charles St., Baltimore, Md.	1915
Powell, S. T.	100 West Fayett St., Baltimore, Md.	1917
Powers, Luther Milton, M. D. (*F*)	1022 North Alvarodo St., Los Angeles, Cal.	1913
Pratt, Aaron P., C. P. H.	York Village, Me.	1916
Pratt, Gilbert H. (*L*)	Box 37, Jersey City, N. J.	1905
Preble, Paul, M. D.	U. S. P. H. S., East Third and Kilgour Sts., Cincinnati, Ohio	1916
Preciado, Alfonso, M. D.	Panama, Panama (Honorary)	1904
Prentiss, S. R. (*E, S*)	31 Kenduskeag Ave., Bangor, Me.	1912
Prescott, Prof. Samuel C. (*L, E, F*)	585 Boylston St., Boston, Mass.	1902
Prest, Charles S., M. D.	54 Third St., Waterford, N. Y.	1912
Price, George M., M. D. (*S*)	31 Union Sq., New York City	1912
Price, Wm. H., M. D.	Washington Arcade, Detroit, Mich.	1913
Prince, Gorman M. (*F*)	Hobart, N. Y.	1917
Provist, Andrew J. (*E*)	39 West 38th St., New York City	1910
Prucha, Martin J.	University of Illinois, Urbana, Ill.	1915
Prudden, T. Mitchell, M. D. (*L*)	160 West 59th St., New York City	1904
Prudential Insurance Company of America, The	Broad St., Newark, N. J.	1917
Pryer, Roy W. (*L, F*)	Detroit Board of Health, Detroit, Mich.	1916
Purdy, C. H. (*V*)	Aragon Hotel, Jacksonville, Fla.	1914
Pusey, Allen, M. D.	7 West Madison St., Chicago, Ill.	1916
Putnam, Mrs. Wm. Lowell (*F*)	49 Beacon St., Boston, Mass.	1915

Quessy, A. H., M. D.	Fitchburg, Mass.	1915
Quimby, Frederick E.	Gatun, C. Z.	1913

Race, Joseph (*L, E, F*)	428 Slater St., Ottawa, Ont.	1912
Rahn, Prof. Otto (*L*)	1111 West Stoughton St., Urbana, Ill.	1914
Ramaley, Prof. Francis (*L, S*)	University of Colorado, Boulder, Colo.	1913
Ramsdell, J. Walter (*F*)	Ford Motor Co., Hygienic Lab., Detroit, Mich.	1917
Ramsey, H. J.	Pamologist, Bureau of Markets, U. S. Dept. of Agriculture, Washington, D. C.	1917
Rand, W. H., M. D.	1440 Clifton St., Washington, D. C.	1915
Randolph, Agnes D.	1110 Capitol St., Richmond, Va.	1914
Rankin, Watson S., M. D. (*P, V, F*)	State Dept. Bldg., Raleigh, N. C.	1909

Raunick, John M. J., M. D. (*V, F*)	212 Hamilton St., Harrisburg, Pa.	1915
Ravenel, M. P., M. D. (*L, F*)	University of Missouri, Columbia, Mo.	1897
Raver, Carl F., M. D. (*L*)	Hygienic Institute, La Salle, Ill.	1914
Rawlings, Isaac D., M. D. (*P*)	1436 Sherwin Ave., Rogers Park Sta., Chicago, Ill.	1909
Raycroft, Prof. Joseph Edw. (*P*)	Princeton University, Princeton, N. J.	1914
Read, Albert J., M. D.	19 Howland St., Battle Creek, Mich.	1917
Reasner, Wm. F., M. D.	Dept. of Health, City Hall, Chicago, Ill.	1917
Rector, Frank L., M. D. (*L, F*)	36 Forty-First St., Brooklyn, N. Y.	1909
Redfield, Harry W., Ph. D. (*F*)	422 Kenyon St., N. W., Washington, D. C.	1916
Redmond, Francis J., M. D.	Fillmore, N. Y.	1915
Reed, Talbot, M. D.	400 Pacific Ave., Atlantic City, N. J.	1917
Reeder, Charles L., M. D.	208 Reeder Bldg., Tulsa, Okla.	1917
Reeks, T. Eben	City Hall, New Britain, Conn.	
Register, F. M., M. D.	Supt. of Health, Northampton County, Box 127, Jackson, N. C.	1917
Reichel, John, M. D. (*L, F*)	Glenolden, Pa.	1907
Reid, Herbert I. (*E*)	505 North Webber St., Colorado Springs, Colo.	1913
Reilly, Walter A., A. M. M. D.	172 Meadow St., Naugatuck, Conn.	1916
Reinoehl, John Krause	*Address unknown*	1913
Reppard, M. M., M. D.	Middlebourne, W. Va.	1917
Rettger, Prof. Leo F. (*L*)	198 Edwards St., New Haven, Conn.	1915
Revell, D. G. (*L, P*)	Edmonton, Alta.	1907
Rex, Clarence P. (*L, F*)	346 Valentine Bldg., Toledo, Ohio	1912
Reynolds, Arthur R., M. D.	300 South Wabash Ave., Chicago, Ill.	1917
Reynolds, E. D.	317 Adams St., Macon, Ga.	1917
Rhame, Wm., M. D.	Freeport, N. Y.	1915
Rhynus, C. P. (*L, E*)	U. S. Marine Hospital, New Orleans, La.	1914
Rich, Edward D. (*E*)	621 Oakland Bldg., Lansing, Mich.	1913
Richards, B. U., M. D.	10 Summer St., Pawtucket, R. I.	1917
Richards, Edgar	60 Ayrault St., Newport, R. I.	1889
Richards, Louis J. (*P*)	City Hall, Elizabeth, N. J.	1909
Richardson, Anna M., M. D.	140 Mountain Ave., Summit, N. J.	1915
Richardson, Mark W., M. D. (*L, V*)	23 Equitable Bldg., Boston, Mass.	1909
Richmond, W. D., A. B., A. M., M. D. (*F*)	209–211 Empire Bldg., Knoxville, Tenn.	1914
Rickards, Burt R. (*L, P, E*)	91 Lincoln St., Melrose, Mass.	1901
Reiderer, Emil J.	c/o Atlas Powder Co., Wilmington, Del.	1917
Riser, Luther A., M. D.	Dir. P. H., State Board of Health, Columbia, S. C.	1917
Ritchie, John, Jr. (*V, P*)	Mass. Institute of Tech., Cambridge, Mass.	1912
Ritchie, Prof. John W. (*V*)	2A Beech Ter., Yonkers, N. Y.	1914
Ritenour, W. Scott, M. D.	c/o U. S. P. H. S., Court House, Anniston, Ala.	1917
Rittenhouse, Elmer E. (*S, V*)	120 Broadway, New York City	1915
Rivero, Filiberto, M. D. (*I, S*)	127 Reina St., Havana, Cuba	1915
Rives, William C., M. D.	1702 Rhode Island Ave., Washington, D. C.	1885
Roach, Walter W., M. D.	2905 Columbia Ave., Philadelphia, Pa.	1915
Roberg, David N., M. D. (*V*)	D. T. M., 1012 Selling Bldg., Portland, Ore.	1916
Roberts, C. F., M. D. (*P*)	350 West 72d St., New York City	1892
Roberts, David W. (*I, S*)	Birch Knoll, Fredericton, N. B.	1917
Roberts, James, M. D. (*P*)	City Hall, Hamilton, Ont.	1907
Robertson, John Dill, M. D.	City Hall, Chicago, Ill.	1915
Robin, Albert, M. D. (*L*)	1202 Delaware Ave., Wilmington, Del.	1899
Robin, W. H., M. D.	City Board of Health, New Orleans, La.	1917
Robins, Vernon, M. D.	State Board of Health, Montgomery, Ala.	1916
Robinson, Dana E., M. D. (*I, S, V*)	Ellis Island, New York City	1916
Robinson, George L. (*L*)	39 East 28th St., New York City	1913
Robinson, John A., M. D.	30 North Michigan Blvd., Chicago, Ill.	1914
Rockhill, C. S., M. D.	909 Union Central Bldg., Cincinnati, Ohio	1914
Rockwell, Alvin H., M. D.	510 South Burdick St., Kalamazoo, Mich.	1913
Roddy, John A., M. D., c/o Louis Gerschenfeld, M. D.	1732 South 9th St., Philadelphia, Pa.	1914
Rogers, Burton R., D. V. M.	118 East 43d St., Chicago, Ill.	1918
Rogers, James Frederick, M. D.	447 George St., New Haven, Conn.	1917
Rogers, Lore A. (*L*)	3735 Oliver St., Washington, D. C.	1913
Rogers, Margaret Anne, R. N. (*S*)	Children's Free Hospital, Detroit, Mich.	1916
Rohn, Minna Mary, M. D.	20 Charlesgate West, Boston, Mass.	1917
Rose, Lorenzo O., M. D.	Parkersburg, W. Va.	1907
Roscoe, H. L.	K. C. S. Ry., Pittsburg, Kans.	1915
Rosenau, Milton J., M. D. (*L, F*)	82 Stedman St., Brookline, Mass.	1909
Rosenberger, Randle C., M. D.	Jefferson Medical College, Philadelphia, Pa.	1915
Ross, Luther S.	1308 27th St., Des Moines, Iowa	1915
Round, L. A., M. D. (*L, F*)	Bureau of Chemistry, U. S. Dept. of Agriculture, Washington, D. C.	1911
Rouse, David E., M. D., M. S.	205 West Dewey Pl., San Antonio, Texas	1917
Routh, F. M., M. D. (*F*)	Greenwood, S. C.	1917
Routzahn, E. G. (*S*)	130 East 22d St., New York City	1912
Roy, Thos. A., M. D.	Mansura, La.	1917
Royer, B. Franklin, M. D. (*P*)	331 Donaldson Aptms., Harrisburg, Pa.	1907

Rubinow, I. M., M. D., Ph. D. (*S*)	131 East 23d St., New York City	1916
Rucker, W. C., M. D.	Ass't Surg. Gen., U. S. P. H. S., Washington, D. C.	1910
Ruediger, Gustav F., M. D. (*P*)	General Delivery, La Salle, Ill.	1908
Ruehle, G. L. (*L, F*)	N. Y. Agri. Exper. Sta., Geneva, N. Y.	1914
Ruhland, George C., M. D. (*L, F*)	City Health Dept., Milwaukee, Wis.	1914
Runcie, W. H., M. D. (*P*)	103 West Merrick Rd., Feufort, N. Y.	1915
Rush, Prof. J. E. (*E, S, F, P*)	Carnegie Institute Tech., Pittsburgh, Pa.	1914
Russell, J. B., M. D.	*Address unknown*	1886
Ruttan, Henry	City Hall, Winnipeg, Man.	1908
Ryan, John N., M. D.	158 Lexington Ave., Passaic, N. J.	1915
Ryland, C. T., M. D.	1022 Main St., Lexington, Mo.	1916
Sadler, Wilfrid, M. Sc., B. S A., N. D. D. (*F*)	Bacteriological Labs., MacDonald College, Quebec	1917
Sadler, Wm. S., M. D.	32 North State St., Chicago, Ill.	1917
Sadtler, Samuel S.	210 South 13th St., Philadelphia, Pa.	1915
Safford, Victor, M. D.	U. S. Immigration Sta., Boston, Mass.	1915
Salmonde, H. F. (*L*)	West Parish Filters, Westfield, Mass.	1910
Salthe, Ole (*F*)	1424 East 13th St., Brooklyn, N. Y.	1917
Samper, B., M. D.	P. O. Box 77, Bogota, Columbia, S. A.	1916
Sandblad, A. G., M. D.	728 South Union Ave., McKeesport, Pa.	1918
Sanborn, Morton F. (*L, E*)	30 Ten Eyck Ave., Albany, N. Y.	1914
Sappington, Harry O., M. D. (*E*)	Galveston, Tex.	1914
Sautter, Arthur, M. D.	220 State St., Albany, N. Y.	1915
Saville, Charles (*E, F*)	Dir. of Sanitation, Dallas, Tex.	1913
Saville, Thorndike	53 North Beacon St., Hartford, Conn.	1917
Sawin, Luther Robinson, M. D. (*L*)	Mt. Kisco, N. Y.	1904
Sawyer, F. L.	*Address unknown*	1914
~~Sawyer, W. A.,~~ M. D. (*L, V*)	3123 T St., Sacramento, Cal.	1910
Sayler, Harley L., M. D.	1019 East 6th St., Des Moines, Iowa	1913
Schenk, P. S., M. D. (*F*)	17 Raleigh Ave., Norfolk, Va.	1911
Scheppegrell, Wm., A. M., M. D.	844–46 Audobon Bldg., New Orleans, La.	1916
Schevitz, Jules (*S*)	405 Oklahoma Bldg., Oklahoma City, Okla.	1917
Schier, O. B.	3701 Vernon Ave., Baltimore, Md.	1914
Schmid, Henry E., M. D.	White Plains, N. Y.	1913
Schmidlapp, J. G.	2235 Grandin Rd., East Walnut Hills, Cincinnati, Ohio	1916
Schmidt, K. F., B. Sc.	1201 Sixth St., N. E., Canton, Ohio	1916
Schmidt, Samuel M.	23 Trident Ave., Winthrop, Mass.	1916
Schneider, Edward C. (*L*)	218 East Unitah St., Colorado Springs, Colo.	1913
Schneider, Franz, Jr. (*L, V*)	*The Delineator*, Butterick Bldg., New York City	1908
Schneider, Louis, M. D.	6984 Springfield Ave., Newark, N. J.	1917
~~Schreschewsky, J. W.,~~ M. D.	U. S. P. H. S., Pittsburgh, Pa.	1907
Schoonover, Warren, M. D.	115 East 59th St., New York City	1895
Schorer, Edwin H., M. D. (*L*)	1010 Rialto Bldg., Kansas City, Mo.	1907
Schroeder, May C., M. D. (*L*)	Research Laboratories, Foot of East 16th St., New York City	1912
Schroeder, William, Jr., M. D.	Room 1501, 61 Broadway, New York City	1917
Schuster, B. L., M. D. (*F*)	P. O. Box 364, Albany, N. Y.	1917
Schuyler, Louisa Lee	570 Park Ave., New York City	1915
Schwachtgen, G. B., M. D (*V*)	89 Fox St., Aurora, Ill.	1917
Schwartz, Edward J., M. D.	93 East Main St., Salem, Ohio	1916
Schwartz, Frederick W. (*I*)	439 Hamilton St., Albany, N. Y.	1914
Schweitzer, Ada E., M. D. (*L*)	1205 College Ave., Indianapolis, Ind.	1913
Scofield, Norman B.	Sunnyvale, Cal.	1916
Scott, Prof. Ernest	715 North Park St., Columbus, Ohio	1912
Scott, Raymond	In Charge Workmen's Compen., Baldwin Locomotive Works, 500 North 15th St., Philadelphia, Pa.	1917
Scott, Walter A., M. D.	598 Pine Ave., Niagara Falls, N. Y.	1917
Scott, Mrs. Wm. E. D.	Sec., Connecticut Research Assn., 36 Washington Ave., Greenwich, Conn.	1917
Scudder, N. C., M. D. (*L*)	104 West Liberty St., Rome, N. Y.	1914
Scully, Jno. R., M. D., V. S., H. O. (*F*)	77 Brunel St., Waycross, Ga.	1916
Seabright, John E. (*L*)	*Address unknown*	1913
Seaman, Carl O.	Health Officer, Board of Health Office, Manchester, N. H.	1917
Sears, F. W., M. D.	602 West Onondaga St., Syracuse, N. Y.	1914
Sears, Harry B., M. D.	112 Park Ave., Beaver Dam, Wis.	1916
~~Sedgwick,~~ Prof. W. T. (*L, E*)	Mass. Institute of Tech., Cambridge, Mass.	1902
Seemann, W. H., M. D. (*L, F*)	Louisiana State Board of Health, New Orleans, La.	1913
Selby, Clarence D., M. D. (*S*)	332 Collingwood Pl., Toledo, Ohio	1914
Seligman, Isaac	1 William St., New York City	1915
Sell, F. W., M. D. (*L*)	102 Irving St., Rahway, N. J.	1907
Sencindiver, J. H. (*F*)	48 Seaton Pl., Washington, D. C.	1916
Sewell, George, M. D.	1017 Kresge Bldg., Detroit, Mich.	1916
Seymour, Gertrude (*F*)	112 East 19th St., New York City	1915
Seymour, Maurice M., M. D.	Regina, Sask.	1908

Shapiro, Joseph M., M. D.	Camp Donephan, Fort Sell, Okla.	1917
Sharp, Ruby W.	2512 East 73d St., Cleveland, Ohio	1914
Shaw, G. H. (*E, F*)	Bureau Animal Ind., Dept. of Agriculture, Washington, D. C.	1914
Sheehan, W. J., M. D.	103 Westchester Ave., Port Chester, N. Y.	1915
Sherban, Daniel V. (*F*)	1103 West 2d St., Old City, Pa.	1916
Sherbon, Florence Brown, A. M., M. D.	1131 Ohio St., Lawrence, Kans.	1917
Sherman, Frank J., M. D.	Ballston Spa, N. Y.	1917
Sherman, Prof. Henry C. (*F*)	Columbia University, New York City	1914
Shields, Edgar Thomas, M. D.	R. F. D. No. 2, Lewisburg, Pa.	1917
Shields, Warren Sylvester, M. D.	106 East Brookline St., Boston, Mass.	1917
Shields, William S. (*L*)	1201 Hartford Bldg., Chicago, Ill.	1912
Shiner, William, M. D. (*L*)	122 State House, Indianapolis, Ind.	1912
Shinkle, A. Clifford	115 East 4th St., Cincinnati, Ohio	1914
Shipley, Alfred E., M. D.	111 Halsey St., Brooklyn, N. Y.	1915
Shore, C. A., M. D. (*L, E*)	Holleman Bldg., Raleigh, N. C.	1909
Showalter, R. W.	Eli Lily & Co., Indianapolis, Ind.	1916
Shuey, Arthur Ferguson	State Board of Health, Jacksonville, Fla.	
Siegmund, Harry B.	1918 Wilkens Ave., Baltimore, Md.	1915
Siever, Chas. M., M. D. (*I*)	Kansas State Agricultural College, Manhattan, Kans.	1917
Sifton, Clifford	Ottawa, Ont.	1910
Simmons, Richard H., M. D. (*L*)	118 South 6th St., Shamokin, Pa.	1914
Simons, George W., Jr. (*L*)	232 West 19th St., Jacksonville, Fla.	1914
Simpson, A. U., M. D. (*L, P*)	508 Cobb Bldg., Seattle, Wash.	1916
Simpson, Charles E., M. D.	100 Holyrood Ave., Lowell, Mass.	1915
~~Simpson, R. M., M. D.~~ (**P*)	702 Sterling Bank, Winnipeg, Man.	1906
Sims, Grace W.	105 East 22d St., New York City	1917
Sinclair, Alice	261 William St., Belleville, Ont.	1915
Singer, William F.	114 West 9th St., Pueblo, Colo.	1913
Skinner, John F. (*E*)	31 Somerset St., Rochester, N. Y.	1915
Skinner, J. O., M. D.	Supt., Columbia Hospital, Twenty-fifth and Penn Aves., Washington, D. C.	1917
Skoog, Paul Leonard (*F*)	944 South 2d St., Springfield, Ill.	1914
Slack, Albert J. (*L*)	Institute of Public Health	1906
Slack, Francis H., M. D. (*P, F*)	Dir. Sias Lab., Brookline, Mass.	1905
Slataper, Felician J., M. D.	Houston High School, Houston, Tex.	1915
Slee, Arthur M. (*L*)	Swiftwater, Pa.	1913
Slemons, Clyde C., M. D.	City Hall, Grand Rapids, Mich.	1915
Smedley, Anderson L., M. D.	N. W. Cor. 3d and High Sts., Hamilton, Ohio	1914
Smersh, F. M., M. D.	Owatonna, Minn.	1899
Smillie, Wilson G., M. D.	State Board of Health, Raleigh, N. C.	1917
Smith, A. T. (*I, E*)	c/o R. U. V. Co., 50 Broad St., New York City	1917
Smith, Clarence E., D. V. S. (*P, F*)	City Health Comm'r, Greenville, S. C.	1914
Smith, Claude A., M. D. (*L*)	City Hall, Atlanta, Ga.	1911
Smith, Clyde F.	Bureau Sanitary Engineering, State Board of Health, Berkeley, Cal.	1915
Smith, E. E., 2d (*L*)	West Virginia Water & Electric Co., Charleston, W. Va.	1916
Smith, Garret	106 North Plymouth Ave., Rochester, N. Y.	1915
Smith, Geo.	Health Officer, Manchester, Vt.	1916
Smith, George H., M. D. (*L*)	The School of Medicine, Yale University, New Haven, Conn.	1911
Smith, John A., M. D.	P. O. Box 58, Capitol Sta., Albany, N. Y.	1914
Smith, R. Morton, M. D. (*P*)	Riverpoint, R. I.	1911
~~Smith, Stephen, M. D.~~	Skaneateles, N. Y. (Honorary)	1872
Smith, Waldo J. (*E*)	Municipal Bldg., New York City	1913
Smith, William W.	2111 Robinson Ave., Portsmouth, Ohio	1916
Smock, John C.	Hudson, N. Y.	1899
Smyth, Francis R., M. D.	Bismarck, N. D.	1912
Smyth, Henry Field, M.D.	Dir. P. H. Laboratory of Hygiene, University of Pennsylvania, Philadelphia, Pa.	1917
Snow, H. O., M. D.	District Health Officer, State Board of Health, Tampa, Fla.	1917
~~Snow, William F., M~~. D.	2806 Cathedral Ave., Washington, D. C.	1909
Solis-Cohen, Meyer, M. D. (*P*)	4102 Girard Ave., Philadelphia, Pa.	1915
Soper, George A., M. D. (*E*)	391 West End Ave., New York City	1900
Sorkness, Paul, M. D. (*V, F*)	Edwards Bldg., Fargo, N. D.	1916
Soule, A. M. G. (*F*)	Chief Bureau of Inspectors, Dept. of Agriculture, State House, Augusta, Me.	1917
Spalding, Herman, M. D. (*P*)	5800 Blackstone Blvd., Hyde Park Sta., Chicago, Ill.	1900
Sparling, George H. T., M. D.	Newcastle, Wash.	1916
Spaulding, Chas. H.	Room 503, Federal Bldg., Providence, R. I.	1914
Spear, Major W. E. (*E*)	c/o Camp Quartermaster, Camp Upton, Long Island, N. Y.	1913
Spencer, L. E., M. D.	Deputy State Health Officer, Wausaw, Wis.	1917
Sperry, Joel A., 2d (*L*)	1004 West Oregon St., Urbana, Ill.	1914
Spindel, E. S., M. D.	Myers Bldg., Springfield, Ill.	1916
Spitz, Herman, M. D.	319–323 Doctors Bldg., Nashville, Tenn.	1915
Spoor, A. A., M. D.	Bact., 306 South Butler St., Lansing, Mich.	1916
Sprague, John Titcomb, M. D.	514 Bay St., Stapleton, N. Y.	1915

Sprenger, Fred K.	Bronxville, N. Y.	1915
Spurr, James Henry	Experiment Station, Lawrence, Mass.	1915
Stadtmueller, Frank H. (*F*)	Elmwood, Conn.	1916
Stage, Lou E. (*P*)	Bliss, N. Y.	1915
Stahr, Charles P., M. D.	City Hall, Lancaster, Pa.	1915
Starr, E. B., M. D.	City Bldg., Springfield, Ohio	1916
Steffen, Charles J.	459 Thirtieth Ave., Milwaukee, Wis.	1914
Stevens, Lawrence, M. D.	Box 288, Bridger, Mont.	
Stevens, Nellie C.	725 South 3d St., Ocala, Fla.	1914
Stevens, Richard	Hoboken, N. J.	1915
Stevenson, Albert F. (*F, L, I, E*)	3609 Wisconsin Ave., Washington, D. C.	1913
Stevenson, W. L. (*E*)	6912 Ridge Ave., Philadelphia, Pa.	1912
Steventon, G. C., M. D.	City Hall, Youngstown, Ohio	1907
Stewart, G. McG., M. D.	U. S. P. H. S., 2005 St. Charles Ave., New Orleans, La.	1917
Stewart, Henry V. (*L, F*)	11th and Bank Sts., Richmond, Va.	1914
Stewart, J. Reverdy	1515 You St., Washington, D. C.	1914
Stewart, Paul M., M. D.	612 Commercial Bank Bldg., Charlotte, N. C.	1916
Stidham, Harrison	Wilkins Bldg., Washington, D. C.	1914
Stiles, Prof. Ch. Wardell (*V*)	25th and E Sts., Washington, D. C.	1904
Stiles, George W., Jr. (*L, F*)	Tabor Opera House Bldg., Denver, Colo.	1909
Stimson, Arthur M., M. D.	War College, Newport, R. I.	1914
Stingily, Clyde R. (*L*)	State Health Lab., Jackson, Miss.	1914
Stokes, Wm. Royal, M. D. (*L, P*)	Lab. State Health Dept., City Hall Annex No. 1, Baltimore, Md.	1899
Stone, Bingham, M. D. (*L*)	184 Church St., Burlington, Vt.	1900
Stone, Ellen A., M. D. (*P*)	Supt. of Child Hygiene, Health Dept., Providence, R. I.	1914
Stone, Marray C., M. D. (*L*)	1107 Bardell St., Springfield, Mo.	1913
Stone, W. C., M. D.	Ellicott City, Md.	1915
Storey, Prof. Thomas A., M. D. (*F*)	College of the City of New York, New York City	1912
Story, Robert V. (*L*)	1426 Carroll St., St. Louis, Mo.	1914
Stoumann, Knud	Prudential Insurance Co., Newark, N. J.	1915
Stovall, William D., M. D. (*L*)	State Hygienic Lab., Madison, Wis.	1914
Straus, Prof. Aubrey H. (*L, P, E*)	Dept. of Bacteriology, Medical College of Virginia, Richmond, Va.	1909
Straus, Charles	141 Broadway, New York City	1914
Straus, Nathan	33 West 42d St., New York City	1903
Street, John Philips, M. S. (*F*)	Drawer No. 1, New Haven, Conn.	1917
Streeter, Howard A., M. D. (*V, S, F*)	740 Dalton Ave., Pittsfield, Mass.	
Streeter, H. W.	U. S. Hygienic Lab., 25th and E Sts., N. W., Washington, D. C.	1914
Stuart, Edward	American Red Cross, American Consulate, Nish, Serbia	1914
Summers, B. E. (*P*)	City Hall, Richmond, Va.	1914
Sumner, Guilford H., M. D. (*P, S, V, F*)	Capitol Bldg., Des Moines, Iowa	1913
Supplee, George Cornell, M. S. A.	407 College Ave., Ithaca, N. Y.	1915
Sutherland, Chas. H., M. D.	Janesville, Wis.	1915
Swan, Horace C., M. D.	Trinity College, Hartford, Conn.	1917
Swarts, Gardner T., M. D. (*L, E, V, F*)	70 Waterman St., Providence, R. I.	1899
Swarts, Gardner T., Jr., M. D., C. E.	Box 331, Providence, R. I.	1915
Sweet, A. L., Ph. D. (*L*)	Box 112, Sea Girt, N. J.	1913
Swingle. Prof. D. B. (*L*)	702 South Grand Ave., Bozeman, Mont.	1915
Sydenstricker, Edgar	Statistician U. S. P. H. S., 310 Chapman Bldg., Spartanburg, S. C.	1917
Sylvester, Ira W.	Alexandria, La.	1903
Szwajkart, Adam	3535 West Diversey Ave., Chicago, Ill.	1914

Taft, Prof. William Howard	New Haven, Conn.	1910
Talbert, C. M.	Room 322, City Hall, 12th and Market Sts., St. Louis, Mo.	1916
Talbot, A. N. (*E*)	1013 West California Ave., Urbana, Ill.	1913
Talbot, Prof. Marion (*S, F*)	Green Hall, University of Chicago, Chicago, Ill.	1893
Tanner, Fred W. (*L, F*)	Bacteriological Dept., University of Illinois, Urbana, Ill.	1914
Tanner, Wallace J.	419 Second Ave., N., St. Petersburg, Fla.	1914
Tapper, John W.	City Hall, Lynn, Mass.	1918
Tarbett, Ralph E. (*E*)	City Hall, Little Rock, Ark.	1914
Tarlton, Theophilis Tonlmin, A. B., A. M., M. D.	Grand Coteau, La.	1917
Tatum, F. L., M. D.	De Funiak Springs, Fla.	1917
Taylor, George R.	1021 Munroe Ave., Scranton, Pa.	1917
Taylor, Henry W.	100 State St., Albany, N. Y.	1915
Taylor, Hurbie Andrews, M. D.	Hamburg, Ark.	1917
Taylor, John R., M. D.	22 Prospect Ave., Madison, Wis.	1915
Taylor, Joseph E., M. D.	102 Forest Ave., Montgomery, Ala.	1914
Taylor, Paul T. (*S*)	105 East 22d St., New York City	1913
Tedesche, Leon G., M. D. (*L, E, F*)	3455 Wilson Ave., Cincinnati, Ohio	1903
Teimer, Theodor, M. D.	184 Clinton Ave., Newark, N. J.	1919
Tennessee Anti-Tuberculosis Association	323 Sixth Ave., N., Nashville, Tenn.	1915
Tenney, Elmer S., M. D. (*L*)	Comm'r State Dept. of Health, Lincoln, Neb.	1916
Terrell, Alan G.	22d St. near Griffin Ave., Riverhead, N. Y.	1913

Terrell, Truman C., M. D.	320 Texas State Bank Bldg., Fort Worth, Tex.	1915
Terrill, James J., M. D.	610 North 7th St., Temple, Tex.	1915
Terry, C. E., N. D. (*P*, *E*, *F*)	Health Editor, *The Delineator*, Butterick Bldg., New York City	1910
Tetrault, Philip A.	Purdue University, Lafayette, Ind.	1914
Tetreau, Thomas, M. D. (*P*)	Portland, Me.	1912
~~Texas State Board of Health~~	Austin, Tex.	1915
Thabault, George, M. D.	132 Main St., Winooski, Vt.	1916
Thames, John, M. D. (*F*)	Health Officer, Municipal Bldg., Winston-Salem, N. C.	1916
Theribault, Emery J.	U. S. P. H. S., Cincinnati, Ohio	1915
Thomas, Arthur H.	Haverford, Pa.	1913
Thompson, Alec Nicol, M. D.	De Kalb Ave. and Raymond St., Brooklyn, N. Y.	1916
Thompson, I. F.	710 Sixth Ave., Eau Claire, Wis.	1917
Thompson, L. R., M. D.	Marine Hospital, Cincinnati, Ohio	1916
Thompson, O. P.	935 West 3d St., Waterloo, Iowa	1914
Thomson, T. F., M. D.	City Health Board, Milwaukee, Wis.	1915
Thomson, W. F. (*F*, *V*)	Perlstein Bldg., Beaumont, Tex.	1915
Thorkelson, C. E., B. S.	City Hall, Racine, Wis.	1917
Thrash, Elmore C.	428 Chandler Bldg., Atlanta, Ga.	1914
Tice, William G., B. Sc. (*F*, *L*)	Bureau of Foods and Drugs, State Health Dept., Trenton, N. J.	1909
Tiffany, John L.	170 William St., New York City	1915
Tigag, J. L. (*E*)	189 High St., Holyoke, Mass.	1910
Tinkham, Henry C., M. D.	46 North Winooski Ave., Burlington, Vt.	1914
Tinsman, Joseph A. (*E*)	2145 Derry St., Harrisburg, Pa.	1913
Tlusty, Anthony	202 Sixteenth Ave., W., Cedar Rapids, Iowa	1913
Tobey, James Alner	U. S. P. H. S., Board of Health, City Hall, Chillicothe, Ohio	1916
Todd, Abel (*F*)	817 West Lapeer St., Lansing, Mich.	1917
Tolman, Edward Mayo (*I*, *E*, *F*)	State Health Board, State Capitol, Charleston, W. Va.	1915
Tombs, John	Commercial Club Bldg., Albuquerque, N. Mex.	1917
Torralbas, Frederico, M. D. (*P*)	36 Tejadello, Havana, Cuba	1912
Torrance, F., M. D. (*F*)	General Canadian Bldg., Ottawa, Ont.	1913
~~Trask, John W.~~, M. D. (*P*, *V*, *F*)	3 B Street, S. E., Washington, D. C.	1909
Traynham, A. P., M. D.	1110 Capitol Bldg., Richmond, Va.	1915
Trembley, Charles C., M. D.	Saranac Lake, N. Y.	1915
Trockey, S. N., M. D.	1800 Clifton Park Ave., Chicago, Ill.	1917
Trost, Clo. Sam W.	12 West Canal St., Cincinnati, Ohio	1916
Tucker, Dixon Bohon, M. D.	Stillwater, Okla.	1917
Tucker, Edward J. (*E*)	Capt., Sanitary Corps U. S. N. A., Office of Surg.-Gen., Washington, D. C.	1917
Tucker, George E., M. D. (*P*, *V*)	218 Pine St., San Francisco, Cal.	1912
Tucker, Henry, M. D.	14 Elliott St., Brattleboro, Vt.	1907
Tucker, Wm. C., M. D.	156 Fifth Ave., New York City	1914
Tully, Edward J. (*L*, *E*)	State Sanitary Engineer, State Lab. of Hygiene, Madison, Wis.	1913
Turman, Alexander E., M. D.	17 West Grace St., Richmond, Va.	1909
Turner, Clair E. (*E*)	Mass. Institute of Tech., Cambridge, Mass.	1915
Turrell, Guy H., M. D.	Smithtown Branch, N. Y.	1916
Tuska, Gustave R. (*I*, *E*, *F*)	68 William St., New York City	1915
~~Tuttle, T. D., M. D.~~ (*P*, *V*)	930 Henry Bldg., Seattle, Wash.	1915
Tvedt, H. S.	*Address unknown*	1915
Twombly, Alex H.	50 Church St., New York City	1914
Underwood, A. W., M. D.	St. Augustine, Fla.	1917
Underhill, Eliz. C., M. D. (*F*)	South Hadley, Mass.	1911
Underhill, Fred T., M. D.	City Hall, Vancouver, B. C.	1915
Underwood, Lyman Wm.	Belmont, Mass.	1902
~~Union Dairy Co.~~	2311 Washington Ave., St. Louis, Mo.	1917
Utley, Herbert H., M. D.	Smithfield, N. C.	1914
Van Blarcum, C. C. (S)	122 South Michigan Ave., Chicago, Ill.	1913
Van Buren, George H. (*V*)	Met. Life Ins. Co., 1 Madison Ave., New York City	1912
Van Buskirk, L. H. (*F*)	40 East Northwood Ave., Columbus, Ohio	1915
Van Cleve, Edward M.	412 Ninth Ave., New York City	1916
Van Deusen, W. P. (*L*)	Bact., Filtration Plant, 3510 Architect Ave., N. E., Minneapolis, Minn.	1914
Van Devrede, Jane	801 Price St., Savannah, Ga.	1914
Van Dusen, Edmund C.	Franklin St., Athens, N. Y.	1915
Van Dusen, James Wallace	Major Medical Corps, c/o Surg.-Gen. U. S. A., Washington, D. C.	1915
Van Es, Louis (*L*)	Agricultural College, Fargo, N. Dak.	1909
Van Ingen, Philip, M. D.	125 East 71st St., New York City	1914
Van Wagenen, Bleecker	443 Fourth Ave., New York City	1915
Van Winkle, Howard L., M. D. (*L*)	120 Juniper St., Atlanta, Ga.	1915
~~Vaughan~~, Henry F. (*E*)	City Board of Health, Detroit, Mich.	1914

Vaughan, Milton, M. D., A. B. (*V, F*)	City Hall, Little Rock, Ark.	1915
~~Vaughan, Victor~~ C., M. D. (*L, P*)	R. F. D. No. 3, Duluth, Minn.	1909
Veiller, Lawrence (*P*)	105 East 22d St., New York City	1910
Victors, Ernest A.	133 Geary St., San Francisco, Cal.	1915
Victorson, Ruth M., M. S.	5406 Drexel Ave., Chicago, Ill.	1917
Vinson, Willie J., M. D.	111 East Tarpon Ave., Tarpon Springs, Fla.	1914
Vogelson, John A. (*P*)	710 City Hall, Philadelphia, Pa.	1910
Voigt, Edwin F. (*F*)	362 Chemistry Bldg., University of Illinois, Urbana, Ill.	1917
Von Wedel, Hasson	Von Wedel Laboratories, Dobbs-Ferry-on-Hudson, N. Y.	1915
Vosbury, W. De Witt	601 Market St., Camden, N. J.	1916
Votey, Prof. J. W. (*E, V*)	Burlington, Vt.	1909
Wachter, Leonard M. (*L*)	192 Partridge St., Albany, N. Y.	1906
Wade, Ethel M. (*L*)	State Health Board, Minneapolis, Minn.	1909
~~Wadsworth, Augustus B., M.~~ D. (*L*)	278 Bates St., Albany, N. Y.	1914
Wadsworth, D. U.	1121 South Main St., Tulsa, Okla.	1915
Wagenhals, Herbert H.	Marine Hospital, 3d and Kilgour Sts., Cincinnati, Ohio	1914
Wagner, Adolph (*E*)	Old Dominion Land Co., Newport News, Va.	1912
Wagner, Edward L.	180 Livingston St., Forest Hills, Long Island, N. Y.	1910
Waite, Prof. Herbert H. (*L*)	2144 B St., Lincoln, Neb.	1913
Waite, Willis W., M. D. (*L, F*)	Box 63, El Paso, Tex.	1910
Wakeman, Bertis R.	Hornell, N. Y.	1915
Walcott, William W., M. D.	32 West Central St., Natick, Mass.	1915
Walker, Prof. Elton D. (*E*)	138 South Atherton St., State College, Pa.	1914
Walker, Isaac S. (*E*)	1208 Harrison St., Frankford, Philadelphia, Pa.	1917
Walker, J. T. Ainslie (*L*)	Woolworth Bldg., New York City	1912
Walker, Watson Frank (*I*)	Sanitary Engineer, Detroit Board of Health, Detroit, Mich.	1915
Wall, Edward E. (*E*)	5361 Berlin Ave., St. Louis, Mo.	1914
Wallace, Harry M., M. D.	Greenville, Va.	1917
Wallace, Wm. M. (*L*)	634 Berwick Ave., Detroit, Mich.	1915
Walsh, Groesbeck, M. D.	c/o T. E. I. Co., Birmingham, Ala.	1916
Walsh, James H., M. D. (*L*)	780 Plymouth Ave., Fall River, Mass.	1915
Walsh, Thomas A.	81 Buena Vista Ave., Yonkers, N. Y.	1914
Walsh, Thomas P., M. D.	569 Main St., Middletown, Conn.	1915
Walters, Arthur L., M. D.	317 East Fall Creek Blvd., Indianapolis, Ind.	1917
Walton, James S., M. D.	136 Market St., Amsterdam, N. Y.	1915
Ward, Herbert C.	*Address unknown*	1915
Ward, Willard E. (*F*)	14 Town Hall, Brookline, Mass.	1917
Warren, B. S., M. D. (*V*)	U. S. P. H. S., Washington, D. C.	1912
Warren, George L., M. D.	77 Houston St., Newark, N. J.	1908
Warren, Howard B. (*L*)	915 Church St., Mobile, Ala.	1914
Warriner, Carlos E.	*Address unknown*	1914
Warson, Herbert James, P. D. (*F*)	Delaware College, Newark, Del.	1917
Waterman, Prof. Earle L. (*E*)	State College, Pa.	1914
Watkins, F. L., M. D.	State Board of Health, Jacksonville, Fla.	1917
Watkins, J. A., M. D.	U. S. P. H. S., Pittsburgh, Pa.	1915
Watson, Carl H.	Great Neck, Long Island, N. Y.	1916
Watson, Irving A., M. D.	Board of Health, Concord, N. H.	1881
Watt, Harry F., M. D. (*P*)	Ocala, Fla.	1914
Way, J. Howel	Waynesville, N. C.	1915
Weber, J. J. (*V*)	105 East 22d St., New York City	1915
Webster, George S. (*E*)	4900 Penn St., Philadelphia, Pa.	1912
Webster, Harry E., M. D. (*P, E*)	309 Lyceum Bldg., Duluth, Minn.	1910
Webster, Richard O. (*F*)	1625 Transportation Bldg., Chicago, Ill.	1916
Weeks, D. B.	Marian, Ohio	1916
Weinzirl, Prof. John (*L, F*)	2 Foster St., Brookline, Mass.	1906
Weisman, Charles (*S*)	152 Atlantic Ave., Brooklyn, N. Y.	1916
Weiss, John M. (*I, L*)	210 West 110th St., New York City	1914
Welch, Harry E., M. D. (*P*)	412 Stamburgh Bldg., Youngstown, Ohio	1909
Welch, S. W., M. D.	State Health Officer, State Board of Health, Montgomery, Ala.	1917
Welch, William H., M. D.	807 St. Paul St., Baltimore, Md.	1917
Weld, Ivan C.	1116 Connecticut Ave., Washington, D. C.	1914
Weldon, L. J.	521 Metropolitan Bldg., Denver, Colo.	1913
~~Wells, Chester~~ H. (*P, E*)	Montclair, N. J.	1907
Wells, Franklin C., M. D.	Medical Director, Equitable Life Assurance Society, 120 Broadway, New York City	1918
Wells, William F., M. D. (*L, E*)	602 Madison Ave., New York City	1910
Werner, Ray C. (*L*)	State Health Board, Atlanta, Ga.	1911
Wesbrook, Frank F. (*L*)	University of British Columbia, Vancouver, B. C.	1897
West, Wm. J., M. D. (*P*)	1000 Grove Ave., Richmond, Va.	1909
Weston, Robert S. (*L, E*)	14 Beacon St., Boston, Mass.	1896
Wetmore, M. R., M. D.	c/o Elizabeth Wetmore, Boyne City, Mich.	1917
Wheeler, Mrs. W. M. (*E, F*)	Women's Municipal League, 6 Marlborough St., Boston, Mass.	1911

Whelen, Charles J., M. D. (*P*)	25 East Washington St., Chicago, Ill.	1910
Wherry, Wm. B. (*L, F*)	City Hospital, Cincinnati, Ohio	1914
Whinery, Samuel (*E*)	95 Liberty St., New York City	1912
Whipple, Prof. George C. (*L, E, V*)	6 Berkeley Pl., Cambridge, Mass.	1899
Whipple, Melville C. (*L, E*)	212 Pierce Hall, Cambridge, Mass.	1915
White, Alfred T.	40 Remsen St., Brooklyn, N. Y.	1899
White, Benjamin, Ph. D. (*L*)	Otisville, N. Y.	1913
White, Courtland Y., M. D. (*L*)	1808 Diamond St.	1912
White, Joseph (*E*)	c/o Braden Copper Co., Rancaqua, Chile, S. A.	1913
White, Wilbur S. (*F*)	609 City Hall, Cleveland, Ohio	1917
White, William C.	Bedford and Wandless Sts., Pittsburgh, Pa.	1913
Whitehead, H. D.	27 North Union St., Petersburg, Va.	1916
Whitelaw, Thomas H., M. D. (*P*)	408 3d St., Edmonton, Alberta	1908
Whitney, Jessamine S. (*S, V*)	Children's Bureau, Washington, D. C.	1907
Whittaker, H. A. (*L, E*)	State Health Labs., Minneapolis, Minn.	1907
Whittier, Frank N., M. D. (*L, S*)	161 Main St., Brunswick, Me.	1912
Whyle, Wm., M. D.	500 Second St., Watertown, Wis.	1904
Wigley, Chester G. (*E*)	State Dept. of Health, Trenton, N. J.	1917
Wilber, Thomas R.	930 Henry Bldg., Seattle, Wash.	1916
Wilbur, Cressy L., M. D. (*V*)	116 South Lake Ave., Albany, N. Y. (Honorary)	1907
Wilbur, Ray L., M. D.	Stanford University P. O., Cal.	1915
Wild, William F., M. D.	State House, Lincoln, Neb.	1915
Wile, Ira S., M. D. (*S*)	230 West 97th St., New York City	1912
Wiley, Harvey W., M. D. (*L, F*)	1120 Woodward Bldg., Washington, D. C.	1901
Willcox, Walter F. (*L. V*)	257 Goldwin Smith Hall, Ithaca, N. Y.	1909
Williams, Anna W., M. D. (*L*)	Research Lab., Foot East 16th St., New York City	1904
Williams, Ennion G. (*L, P, V*)	R. F. D. 4, Richmond, Va.	1905
Williams, Frankwood E., M. D.	50 Union Sq., New York City	1916
Williams, Henry T., M. D.	274 Alexander St., Rochester, N. Y.	1915
Williams, Howard J., M. D.	720 Spring St., Macon, Ga.	1914
Williams, Jesse L.	*Address unknown*	1914
Williams, J. F., M. D. (*S*)	350 Howell Ave., Cincinnati, Ohio	1917
Williams, Linsay R., M. D. (*V*)	884 Park Ave., New York City	1914
Williams, M. B., M. D.	59 Fourteenth St., Wheeling, W. Va.	1917
Williams, Sherman, M. D.	346 Metropolitan Bldg., Denver, Colo.	1913
Williams, Sydney	Wellesley, Mass.	1917
Willis, F. A.	Willis-Jones Milk Co., Philadelphia, Pa.	1913
Willis, Royal H., M. D. (*P*)	205 Park Pl., Brooklyn, N. Y.	1915
Wilmot, Frank A., M. D.	Bethany, Neb.	1917
Wilmot, Frank A., M. D.	38 Hemenway St., Boston, Mass.	1917
Wilsey, W. J. (*F*)	67 State St., Perth Amboy, N. J.	1914
Wilson, Ernest L., M. D.	Bolton Landing, N. Y.	1915
Wilson, John S., M. D.	22 South Hamilton St., Poughkeepsie, N. Y.	1910
Wilson, Prof. Margaret B.	Hunter College, 68th St. and Park Ave., New York City	1915
Wilson, Robert J., M. D.	549 Riverside Dr., New York City	1915
Wilson, William H.	*Address unknown*	1915
Winn, J. C., M. D.	North Titus St., Gilmer, Tex.	1916
Winslow, Prof. C.-E. A. (*L, P, E, V, F*)	Yale University, New Haven, Conn.	1902
Winslow, Paul V., M. D. (*S*)	Poughkeepsie, N. Y.	1913
Wisconsin Industrial Commission	State Capitol, Madison, Wis.	1915
Wodehouse, Robert E., M. D. (*P*)	Dir. Medical Services, Canadian Exped. Force, Hotel Cecil Chambers, Strand, London, England	1910
Wolf, John G., M. D. (*V, F*)	121 West Orman St., Pueblo, Colo.	1914
Wolff, Arthur J., M. D. (*L*)	320 Collins St., Hartford, Conn.	1915
Wolman, Abel (*E, F*)	16 West Saratoga St., Baltimore, Md.	1916
Womer, Alexander, M. D.	1112 South Milk St., New Castle, Pa.	1914
Wood, Alfred V.	1777 Gloucester St., Brunswick, Ga.	1910
Wood, Edward M., M. D.	River Ave., Winnipeg, Man.	1915
Wood, Harold B., M. D. (*V, E*)	State Dept. of Health, Charleston, W. Va.	1909
Woodford, L. G., M. D.	304 Colby Bldg., Everett, Wash.	1916
Woodhull, Gen. A. A.	Princeton, N. J.	1874
Woodmann, Prof. A. G. (*F*)	Mass. Institute Tech., Cambridge, Mass.	1917
Woodruff, Caldwell, M. D.	Deputy State Health Officer, Hyatsville, Md.	1917
Woodruff, Martin C., M. D.	City Health Dept., St. Louis, Mo.	1916
Woods, C. S.	Meth. Episcopal Hosp., Indianapolis, Ind.	1915
Woods, Frank A., M. D. (*P, V*)	238 Maple St., Holyoke, Mass.	1914
Woodward, William C., M. D. (*I, P, V, F*)	1782 Lanier Pl., Washington, D. C.	1896
Woodworth, Elizabeth A., M. D. (*L, F*)	3201 Clinton Ave., Minneapolis, Minn.	1911
Woof, L. A., M. D.	Ravenna, Ohio	1916
Wright, Frank W., M. D. (*P, F*)	10 City Hall, New Haven, Conn.	1889
Wright, Herbert L.	Kenosha, Wis.	1917
Wright, John Henry (*L, F*)	39 West 38th St., New York City	1914
Wright, J. W., M. D. (*P*)	247 West 8th St., Erie, Pa.	1897
Wright, Lieut. Wade, M. D.*	U. S. Army Base Hosp. No. 6, American Expeditionery Forces, Via N. Y.	1916

Wynne, S. W., M. D. (*V*)	149 Centre St., New York City	1915
Yates, Albert, M. D.	South Main St Washington, Mich.	1916
Yen, F. C., M. D. (*S*)	Yale Medical College, Changsha, Hunan, China	1917
Youmans, Iva Catherine	1404 Walnut St., Jacksonville, Fla.	1914
Young, Albion G., M. D. (*V*)	State House, Augusta, Me.	1913
Young, Anna R., M. D.	Presbyterian Hospital, 41 East 70th St., New York City	1912
Young, Augustus A., M. D., B. S. (*P, S*)	22 East Miller St., Newark, N. J.	1915
Young, C. A.	604 Fifth Ave., Ashbury, N. J.	1906
Young, Clifford C. (*L, E*)	State Water Survey, Lawrence, Kans.	1912
Young, C. T., M. D.	Plant City, Fla.	1915
Young, George B., M. D. (*F*)	Norfolk, Va.	1910
Young, Henry Esson, M. D., C. M., LL. D.	Parliament Bldgs., Victoria, B. C.	1916
Young, Nelson E.	309 Mulberry St., Williamsport, Pa.	1917
Zetek, James (*F*)	Entomologist, Box 245, Ancon, C. Z.	1915
Zimmele, George B. (*S, F*)	9 Windsor Terrace, Yonkers, N. Y.	1914
Zimmerman, Samuel A., M. D.	707 Euclid Ave., Valley City, N. Dak.	1915
Zingher, Abraham, M. D.	1st Base Hospital, Camp Upton, Yaplark, N. Y.	1916

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VENEREAL DISEASES AND THE WAR.

SURGEON GENERAL W. C. GORGAS, U. S. A.,
Washington, D. C.

Address before the General Sessions, American Public Health Association, October 19, 1917, at Washington, D. C.

THERE is probably no occasion for pointing out to this association the enormous importance to the military establishment which lays in a proper control of the venereal diseases as far as the army is concerned. It is the greatest cause of disability in the army. The army loses more days of service from its men due to venereal diseases than from any other cause. If the medical department of the army had a choice presented to it, say if some man came with a wand and it were demonstrated that with this wand every wounded man could be gotten back into the line at the end of the second day, with his wound cured; and another course were presented by which all venereal diseases could be eradicated from the army, and our choice were given, permitting us to leave out all sentimental reasons, such as the moral effect upon the community, and allowing us merely to consider the good of the army, and our ability to keep in the line the largest and most efficient fighting force, I think there would be very little hesitation on the part of our department in choosing the eradication of venereal disease. We, in the course of the year, would be able to keep more men in the trenches and have a more efficient force by having eradicated venereal diseases than by eradicating wounds. It does not take long to see how important and how true this is. A man with a flesh wound through the thigh is back in the trenches within ten days or two weeks, frequently in less time. If he contracts a venereal disease, his average disability is very much longer. In other words, to the commanding general, the loss is greater for a man who contracts gonorrhea than for a man who is shot through the thigh, and if the commanding general could lay aside all question of morality, he would probably choose the eradication of venereal disease rather than the prevention of wounds. I merely point that out to show the great importance of the control of venereal diseases as a practical measure to the military sanitarian. Now as to what we can do in these directions, that is of course a question that we are considering very closely and a question that all military sanitarians consider. All of us have our views. I am inclined to think that the military sanitarian leans too much toward the control by actually treating and caring for the case after it occurs and the individual prophylaxis. A large element of our sanitarians believe in the educational process and prevention in that way. My own personal experience inclines me very strongly to the educational side, although of course I like to use all measures that furnish the hope of control. My personal sanitary experience has been very largely in the care and prevention of yellow fever, and my experience in that disease tinctures my sanitary ideas concerning the problem under consideration. When I commenced professional life, had we considered all diseases as we then knew them, I presume that any sanitarian would have thought he had a much greater chance in the controlling of venereal disease or in eradicating smallpox or tuberculosis than he had of doing anything at all with yellow fever. We knew how venereal disease was contracted. With smallpox we could see the perfect possibility of eradicating the disease provided we could carry our prophylactic measures into complete execution. We had vaccination and felt perfectly confident that we could take a company of soldiers, and, by proper vaccination, protect them entirely from smallpox; but with yellow fever we had no idea how to practice preventive methods. Yellow fever to the American army and armies serving in America was of vast importance when I first commenced professional life. When the method of its prevention came up and it was discovered that the mosquito was the carrier, we did not see much further along than we had seen before. We knew the role played by the mosquito, but it did not seem to us that we had any practical means of preventing the mosquito from continuing its carrying of yellow fever as he had been doing for several hundred years before—I suppose he did it for several hundred years before; our experience with yellow fever dates from when it began to spread among the whites after the discovery of America. Before that time it had been confined to very narrow areas, but we went to work in Havana and when we began to put our preventive measures into effect, we loaded our guns as we would a shotgun, we sat down and thought of all the possible things that could affect it, and started out putting them all into effect. Our friend Doctor Chapin came to Havana about that time and affected me very strongly by his views which he was then beginning to develop, that contact was the great means of spreading most infectious diseases. But we went along with our sanitary measures for yellow fever and finally got rid of it entirely in Havana after probably a year's experience with it; but we were all, as the result of this work, convinced that the greatest measure that had been successful was by the isolation and screening of patients and thereby preventing the patient getting access to uninfected persons. We were entirely wrong; I do not think those measures had much effect upon our success, and it was apparently entirely another measure which we carried along at the same time but which we had not given very much stress in judging the results. The measure that was really successful, as we found out afterwards and know now, was the eradication of the particular mosquito that carries the disease. In looking forward to our work, we could see that it was almost impossible to eradicate all mosquitoes and thereby get rid of the particular mosquito that carried the disease, but because a measure cannot be perfect in practice, it is not necessary to be perfect generally; while you cannot eradicate all stegomyia mosquitoes in a place in any ordinary period of time, you can very greatly decrease them. Now you see that a person coming into a community where there are ten mosquitoes, we will say, to any given area, to the acre, in a town, possibly if he went into that acre he would stand a very small chance of being bitten by one of these ten infective mosquitoes; whereas if there were a thousand, his chances would be a great deal increased. Now in practice, if we can destroy mosquitoes below a certain point, the disease will not spread. It is not arbitrary rule, but for practical purposes, when you get your mosquitoes below that point, your disease will not spread. When we next had the disease, we tried in the most extensive way, the killing of infected mosquitoes, screening, etc., without any effect. For about a year we carried into effect all our methods and did it most extensively, which is an illustration of what we had to consider in sanitation and will have to consider in venereal disease. The destroying of infected mosquitoes and screening was so obviously good that it was easy to convince the authorities that it should be done. It was not so obvious that it was good to destroy all mosquitoes, and it was more difficult to convince them. It took a year of failure to convince them that it was necessary that we should do so. Probably if the sanitary officer had had more knowledge and concentrated his eloquence upon the governor with regard to destroying all mosquitoes, he could have been more successful.

Now I am inclined to think that our relations with regard to venereal disease bear somewhat the relation that the sanitary officer had toward yellow fever. I think in going into that we should try all our measures that are practical, but I do not believe that we are going to have any very great success, such success as we had in yellow fever, until we get our communities educated up to the point of believing that it is the individual action and the individual beliefs of our people affected that are finally going to control the disease. It seems to me that if all of our communities were educated up to the point that the female portion of our population have been, with regard to venereal disease, we would have success in it. If the sexual morals of our male population were on the same plane as the sexual morals of our female population, I am inclined to believe that venereal disease prevention would be far on the road to success, and I hope that this relation of morals can be brought about by the very general educational processes that we are at present engaged in spreading through our population.

For military purposes and the purposes of this war, it would be obviously unwise to wait for any slow process of that kind, and any general degree of education. We have to do as we did in yellow fever, load our gun as we would a shotgun and fire at everything in sight, and such are the plans that we are evolving in the army and around our military camps, appealing to all the assistants we can get, to every possible assistance that the civil population in contact with the army can give us in this direction, and at the same time doing everything that we can do in the army towards individual prophylaxis of the men. Such a possibility as educating the population is not a vague dream. Customs and manners can be controlled almost absolutely by education. Take an example that has always impressed me very strongly, of how custom in itself has affected the two sexes as far as manners are concerned. Now take for instance the use of tobacco; the two sexes differ with regard to their use of tobacco purely as the result of belief and custom. The male of our population has acquired the habit of smoking, principally in youth, because he has been taught to look upon it as manly and the proper thing. In the case of the other sex, no such influence has been brought to bear; the female of our population does not look upon smoking—or has not until very recently—(laughter and applause) as being the proper and manly thing. There is no influence brought upon the young woman in general to teach her to learn the habit of the use of tobacco. Among the educated classes of our population the use of alcohol is prevented to a very great extent among the female portion of the population by the same influences. I am merely pointing out that education would have the very greatest effect upon this question of the morals in venereal disease. Another thought that comes up in relation to yellow fever and the question which we are discussing—and I hope you will excuse me for my mind running upon yellow fever, because naturally, with thirty years spent in thinking almost entirely upon the question of yellow fever, I would get rather one-sided—yellow fever now is almost forgotten; I was asked to read a paper the other day and suggest topics of general sanitation for an examination I was engaged in, I was asked to suggest questions in prophylactic medicine, and I suggested the question of asking the symptoms of yellow fever. The board said "Doctor, yellow fever is academic, there is not a single one of these men who is coming before you who has any idea what yellow fever was or is"; so I must ask to be excused if I am one-sided, if I am a back number in regard to sanitation on this question, having dwelt so much on yellow fever; but I would like to recall this to you, in regard to yellow fever and syphilis, and that is, that they were both, like the Irish potato and the turkey, given to us by the Western Hemisphere when Columbus discovered America, and probably if we had been asked, for 300 years after the discovery, which was the greatest evil of the human race, everybody would have agreed that yellow fever was the one. The military surgeon would have agreed that as far as military operations were concerned, in the Western Hemisphere, yellow fever was the greatest of all evils. Surgeons have forgotten what complete destruction yellow fever caused among American troops, particularly in the Tropics.

I want to appeal to the health officers of the country on the importance of the civil health officer notifying in the case of all contagious diseases. The value of the army itself, the importance of our knowing these things so that we can be on guard and be ready to prevent the access of infectious diseases from the localities around us; merely calling attention to the fact probably emphasizes it sufficiently. All health officers will at once see how important it is to the military authorities to know where the infections occur. I want to take occasion at the same time to thank the profession at large, the civil health officers in general and this association in particular for the great assistance that they have all been in our efforts to get ready for this war, the enormous assistance they have been to the medical department of the army in getting together sufficient personnel for the carrying on of this war and performing our functions as far as health is concerned. We started in this war with less than 600 men in the medical corps of the army; we now have approximately 20,000, due to the assistance that all these great bodies have given to the army. I thank you.

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Recent Progress in Tuberculosis.—Dr. J. B. Howes, 2d, and Dr. P. C. Bartlett review the work that has been done in the study of tuberculosis, as evidenced by the important articles that were published during 1916. The review appears in the *Boston Medical and Surgical Journal* for October 18, 1917.

Speaking of tuberculosis in adults, it is agreed that an early diagnosis is important in combating the disease. The diagnosis, however, must be certain, and for this, constitutional signs and symptoms are very important. The presence of tubercle bacilli in the sputum, is not, as a rule, an early sign, and is no longer a requisite for diagnosis. The various laboratory methods used to make an early diagnosis are in the main of little value. The complement fixation test is still in the experimental stage. It is the belief of the authors that tuberculosis is being diagnosed better today than ever before.

In the treatment of the disease, it is agreed that the sanatorium is superior to the home. The advantages are, careful supervision by experts, reduced cost to the patient and the community, formation of new, healthy habits and character, and the development of missionaries to preach how to live well. Climate seems to play a small part in the treatment of the disease. The patients should have sufficient rest and should be permitted to exercise only under direction. It is important to furnish patients with some kind of work.

The greater protection of the health of school children is urged, by full time supervision, more school inspections and nurses, and more fresh air rooms and open air schools for all children.

Many infections take place in early life in the home. Every precaution should be taken to avoid this. Children should be given only pasteurized milk. Kissing on the mouth should be prevented. Coughing mothers and nurses should be examined. Personal hygiene should be taught to every child. Furthermore outdoor schools for children who are well should be encouraged, whereas overstrenuous exercise should be discouraged.

VENTILATION OF ARMY BARRACKS.

Wm. J. Mauer,
Engineer, Chicago Commission on Ventilation, Chicago, Ill.

Read before the Sanitary Engineering Section, American Public Health Association, October 18, 1917, at Washington, D. C.

THE ventilating engineer stands in ill repute today in the eyes of many, not because of lack of knowledge or skill on his part but because of a lack of uniformity of opinion and the need of standards of good air conditions and installation methods.

Ventilation is a definite problem, although varying under different conditions, and each case has its definite solution. The haphazard method of opening a window here and there is not the solution. The proper arrangement of supply and exhaust; the proper allowance of window space for air space; window height for room height; space per occupant, and air distribution and velocity is as definite a problem for the heating and ventilating engineer as the proper portioning of flange areas and web area in a plate girder is to the structural engineer, or intensity of light, size of opening, and time of exposure is to the photographer.

That some of the vital points on proper housing have in the past been overlooked in the design of barracks is evident from the number of cases of disease that existed in camps.

Young men from all walks of life are now concentrating at various training points and as many as 200 are being housed in the same building. If any one of these has measles, mumps, meningitis, pneumonia or other diseases the entire number in that building may be exposed to the infection, and this is especially dangerous when the air supply is inadequate and other points of sanitation are disregarded.

In a recent article by Frederic J. Haskin, special correspondent for *The Chicago Daily News*, the conditions of the French army in the present war were given. He states that "France has discharged 200,000 soldiers on account of tuberculosis since the beginning of the war, and the spread of the disease in the British army has reached such alarming proportions that the civilian population has organized to combat the situation." This comes at a time when France is making a struggle for existence. The fault is not with the French army but with the French people, and when I say this I mean the French medical and engineering societies. "Before the war the death-rate from tuberculosis was nearly three per thousand of population; in the cities the percentage running much higher." The cause was found by the Americans in France who formed a committee for investigation. It was given as *lack of fresh air.* The French are far advanced in the science of anaesthesia and surgery, but backward in sanitary matters. The committee proceeded to educate the public on the value of fresh air and now "windows are being sawed in hundreds of peasants' homes which boasted of none before the war. The propaganda of fresh air and sanitation is having its effect."

"Nothing has proved more discouraging to the fighting forces in Europe than the verdict of the army physician—'wounded with tuberculosis'—a verdict which should be to Americans both a call for help and a cry of warning."

The science of warfare from a standpoint of destruction of life and property has progressed to a most terrible degree in the present war. The medical profession too has made wonderful progress, but the biggest discovery that the medical profession ever made is that "an ounce of prevention is worth a pound of cure."

There have been not less than seven billion lives lost in warfare. Each nation to conquer and become a world leader has had something new to defeat the old. Our efforts should be for the healthiest army of men the world has ever seen. With our problems of transportation, observation, communication, construction and destruction worked out to the present high standard it is a reflection on our civilization to have the problems of health and sanitation lag behind.

Longmore's and other tables show that in the wars of the past two hundred years, which were for a prolonged period, 20 per cent of the total deaths were from bullets and 80 per cent from disease, and comparing this with our Spanish-American War 7 per cent of deaths were from bullets and 93 per cent from disease.

Japan has done more towards preventing disease than any other country and in its war with Russia, six years after our war with Spain, Japan showed a loss of four men or 80 per cent in battle to one man or 20 per cent from disease. This is not the result of good fortune but of precaution. After making a careful and scientific study of army diseases the rules were laid down by the best authorities in Japan and obeyed to the letter by the army. There was no vaccination for typhoid and yet there was practically no typhoid. The army marched through Manchuria, which peninsula is infested with human refuse and a hot bed for typhoid, but the army remained free from the disease because their drinking water was tested and approved before being consumed. No houses that had previously been inhabited by filthy natives were occupied by the army until they had been fumigated and cleaned and remodeled in every respect.

Japan has demonstrated to the world the strength of a healthy army as against the weakness of a diseased army.

We are now eleven years in advance of the Russo-Japanese War and have all the disasters of previous wars before us. Have we learned all that they tried to teach?

Feeble attempts have been made to establish standards for armies of various countries. The cubic feet of space allowed per soldier in barracks has varied from time to time, and in various countries, but the general tendency has been to increase the space.

French infantry, 421 cubic feet.

French cavalry, 491 cubic feet.

Prussian army, 631 cubic feet.

The English government found by Royal Commission that 600 cubic feet was sufficient, provided "local position of barracks be open and airy; the structure of the building simple and admitting free external air and internal movement of atmosphere, and provided the barrack rooms as well as all internal parts of the building are duly ventilated." This shows that the subject has been given some thought, but what engineer would specify "admitting free external air, allow internal movement of air and the building shall be duly ventilated"? This, however, has been made a part of the regulations of the English army. An inspector must inspect monthly, examining the ventilation, heating, light, latrines, closets and all other parts. Besides this, the regiment details a certain number of men to give these points a daily inspection.

HEATING OF BARRACKS.

Shall the men in our army barracks be subjected to extreme changes in temperature and thus become physically hardened?

At first glance it would seem that to prepare an army for war the proper procedure would be to break away from our artificial manner of living and expose our men to heat and cold alike and pick the survivors as those best fit to serve us at the front; in fact, it has been stated there should be no heat supplied to barracks and that the exposure will harden the men and make them more fit for service.

A statement like this is fundamentally wrong and coming, although unofficially, from men in the army it should immediately be argued down. The first tendency for men in a cold room is to close the windows and fill up all openings with papers and rags and thus prevent the free entrance of fresh air and the exhaust of foul. This calls to our mind Ralph Wilder's cartoon of the man closing his bedroom window and the pneumonia germ sitting on the bedpost making the very fitting remark "Whee! he is shutting the window, now I will get him." The next inclination is for the men to huddle in one corner of the room and keep warm by an interchange of body heat. The results on health from this kind of housing are too well known to be discussed at this time.

It might be possible to give orders against the closing of windows and against the crowding of men into corners of the room, as mentioned above, and let us assume that these orders can be followed out to the letter, the following will be the result:

Air that is too cold causes lack of activity; requires more food; causes a lowered vitality; breeds discontent; and the army will show loss of energy and enthusiasm. The argument of "survival of the fittest" is wrong today—the tendency is to conserve and build up.

It is against all good argument and reasoning to house a man in a room with a temperature lower than 10° above the freezing point of water. A German authority on army camps gives 12° C. or $53\frac{1}{2}$° F. as a minimum.

The best system would be steam heat from a central plant and cast-iron wall radiators in the barracks. The temperature should not be too constant, to prevent monotony, and a variation from 45° to 55° would be invigorating and conducive to physical activity.

The barracks that are heated by stoves will be subject to considerable drafts. The heat of a stove is local; those being close by will be too warm while those further away will be too cold. A stove requires constant attention and is the source of considerable dust and dirt, not to mention the danger of fire in the building.

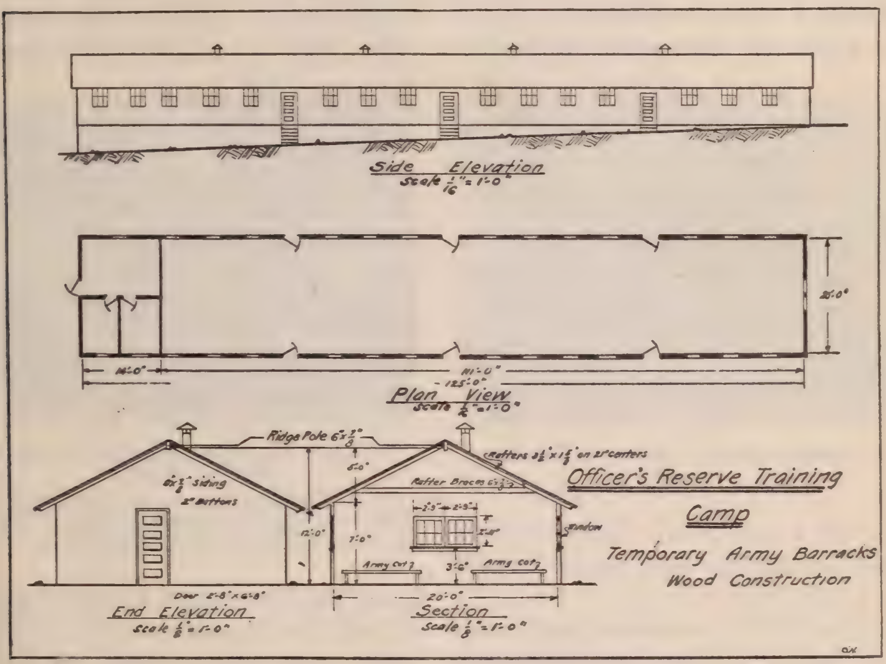

FIGURE 1—OFFICERS' RESERVE TRAINING CAMP.

BARRACKS AT O. R. T. C.

The barracks that are being built by our government for the care of men enlisted in the Officers' Reserve Training Camps are as follows:

There are four buildings required to house one company, two buildings being used for sleeping quarters, one as mess hall and one for wash rooms, shower room and toilets.

We are chiefly interested in the sleeping quarters or barracks proper. This building as reproduced from measurements and photographs is of wood construction, 125 feet long and 20 feet wide. One end is used for office purposes and for officers' quarters and is separated from the remainder of the building by a wood partition extending to the roof. The main portion of the room is used by 80 men and is 111 feet long.

The roof is quarter pitch, built of $\frac{7}{8}$-inch material and covered with roofing felt saturated with asphalt. The sides are $\frac{7}{8}$-inch material with batten strips on the outside. The sides are brought within 3 inches of the roof and this space is open, allowing the free admission of air. This space as well as the doors and windows are screened.

The windows are 2 feet 9 inches wide by 2 feet 11 inches high and there are 28 in the main room, 13 on each side and 2 at one end. These windows slide horizontally and can be opened their full area.

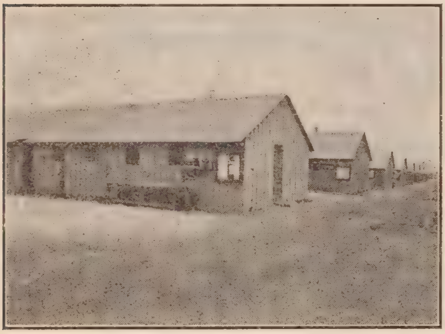

Figure 2—Officers' Reserve Training Camp.

There are six doors in the main room, 3 on each side. Each door is 32 inches wide by 6 feet 8 inches high.

The barracks are lighted by electricity with 60 watt lamps, 10 feet centers, located on the rafters and along the center line of the building.

There are four openings in the roof with metal stacks for stove heaters, three being in the main room and one in the office quarters.

The buildings are of open construction and as they now stand would be very unsatisfactory during severe winter weather. This, however, can easily be overcome by lining with wallboard or similar material and allowing an air space between it and the outer wall. The space at the eaves would need to be nailed tight or provision made for opening and closing at will in cold weather.

The cots are arranged along the wall, transversely to the room, with the head end about 6 inches from the side wall. The windows are 42 inches above the floor and at this height is a 12 inch shelf against the wall. This shelf is used for books and other personal belongings and serves as a shield for the sleeper's head from the direct draft of the window.

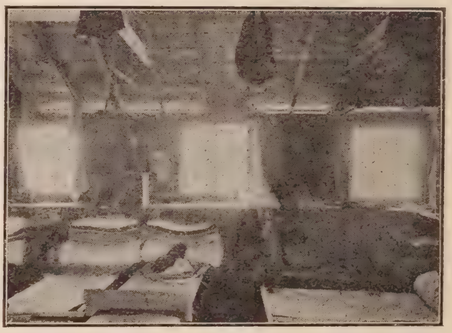

Figure 3—Officers' Reserve Training Camp. Interior.

Note: Windows open horizontally; shelf for books, etc.; clothing scattered about; bed is put up for the day in the manner shown.

As there are 80 men in the main room each man has an allowance of 260 cubic feet of air space, 28 square feet of floor area and 2.8 square feet of window area. Based on the experience of tests made in other buildings it is predicted that the CO_2 will run as high as 12 parts per 10,000.

There is no provision for wardrobe, and a rafter on alternate roof trusses makes a convenient place for the men to hang their clothing. This is clearly shown in the accompanying picture. The dust will run high and if the clothing is damp there will be considerable odors. But the dangerous feature of this practice is the possibility for the spread of disease germs.

The cots are too close together. They are the standard army canvas top cots being 6 feet 6 inches long, 27 inches wide and about 14 inches from the floor. They are arranged in pairs, 17 inches between pairs, which gives 6 feet centers of pairs.

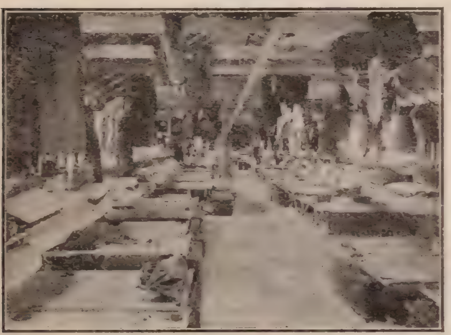

FIGURE 4—OFFICERS' RESERVE TRAINING CAMP. INTERIOR.

Note stove, arrangement of cots and the clothing suspended from rafters.

The interior of the barracks are smooth finished but have not as yet been painted or whitewashed.

At each entrance is a shoe scraper about 30 inches long and 20 inches wide, built of 2-inch by $\frac{7}{8}$-inch wood strips set vertically with $\frac{7}{8}$-inch space between them. This scraper also serves as a doorstep. It is an excellent device for cleaning the shoes before entering the barracks and helps considerably to keep down the dust.

BARRACKS FOR THE DRAFTED ARMY.

The plans for the barracks for the army of drafted men were disclosed this summer and are shown herewith, as reproduced from the *Engineering News-Record* of July 5, 1917. These are somewhat different from the barracks just described. They are two stories high with sleeping quarters for 200 men and each containing its own kitchen and mess room, while the toilets are in separate buildings. The plans have now been changed to house 150 men in these buildings.

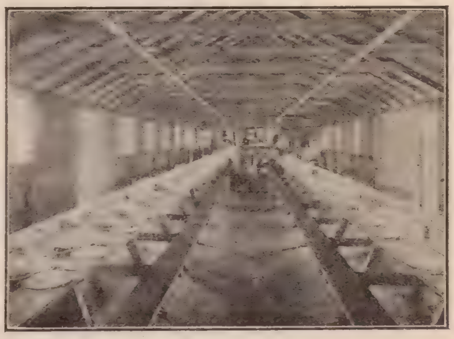

FIGURE 5—O. R. T. C. MESS HALL.

Kitchen at far end; stove heat.

Each barrack is 43 feet wide and 140 feet long, 20 feet of which is but one story high and is used as a kitchen. The ceilings are 9 feet high. On the first floor is a room with 32 double deck bunks, another room as the Company hall, and next to this the mess hall with the kitchen at the end. On the second floor are two rooms for sleeping purposes, one for 36 bunks and one for 32 bunks. Between these two rooms are the first sergeant's office and a large hall. Double deck bunks are contemplated.

The buildings are of wood construction with metal roofs. The side boarding must give a 15-inch clear space above the ground or be carried down to the ground all around.

Lockers are provided in the sleeping quarters and located in the center of the room so as to divide the room into two parts. On the first floor, space is provided for four stoves. The smoke pipe of each stove is provided with a drum on the second floor.

There will be 8 vent ducts 18 inches by 18 inches set in pairs and extend from the first floor ceiling to the ridge vent. The ridge vent runs the entire length of the building.

With 200 men there is an allowance per occupant of 300 cubic feet of air space, 33⅓ square feet of floor area and 4.5 square feet of window area, while with 150 men there is an allowance per occupant of 400 cubic feet of air space, 44 square feet of floor area and 6 square feet of window area. It is predicted that the CO_2 will run 10 parts per 10,000 unless the windows are very carefully adjusted. The windows are of the double hung vertical sliding sash type.

The arrangement of bunks is better than in the barracks previously described, in that they are further from the wall, but it is still a question in the minds of some whether double deck bunks are as satisfactory as the single.

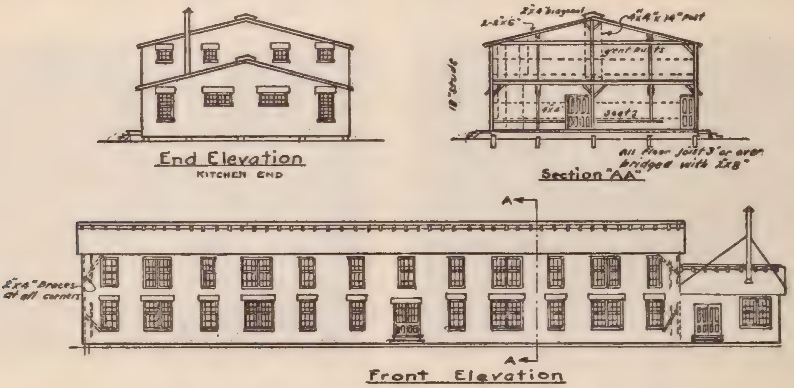

Figure 6—Barracks for Drafted Army.

(From *Engineering News Record*, July 5, 1917.)

The dust count will probably be high because of the presence of lockers all through the center of the room. Men will come from out of doors and their clothing will be dirty or dusty and there will be a great temptation to brush the clothing or shake it on placing same in the lockers. It seems that both from a dust and bacterial standpoint it would be much better to have the lockers in a separate room by themselves, as for instance in the hall shown on the second floor.

The heating system was also changed from stove heat, as at first proposed, to steam heat. This is a very important change, the advantages of steam over stove heating having apparently been recognized.

In Dr. John S. Billings' report dated 1868 the following was read with a great deal of interest: "Doctor Craig's test for air conditions in a barracks is simple and practical," and it is described as follows: "Go into the room about 3.00 a. m. after 15 minutes' walk in the fresh air. If no musty, unpleasant odor is perceived under such circumstances, the ventilation is probably satisfactory."

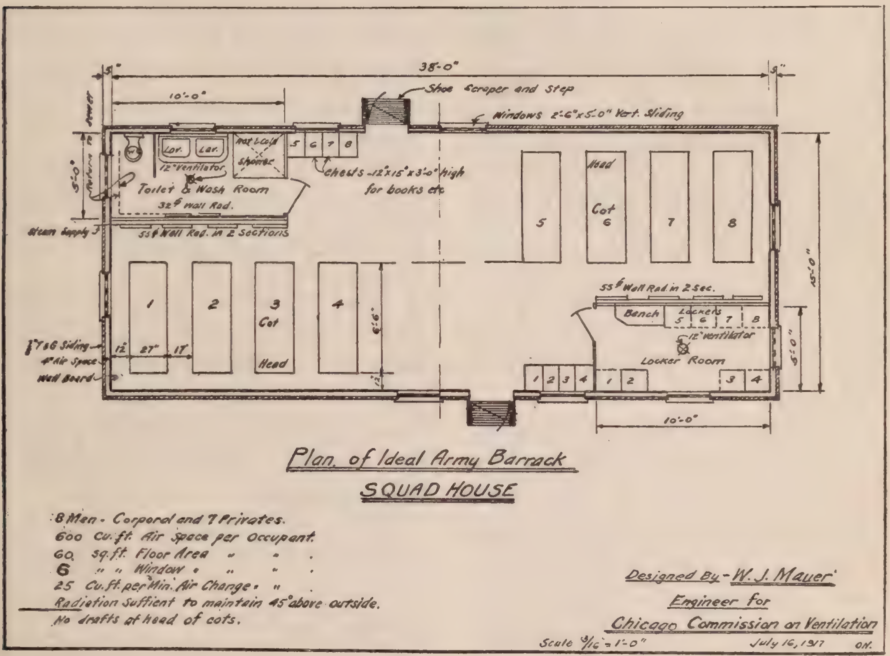
38-0"
5"
5"
10'-0"
Shoe Scraper and Step
Windows 2'-6"x5'-0" Vert. Sliding
Lav.
Lav.
Hot & Cold Shower
5
6
7
8
12" Ventilator
Chests - 12"x15"x3'-0" high for books etc.
Toilet & Wash Room
32# wall Rad.
5'-0"
Steam Supply
55# Wall Rad. in 2 Sections
1
2
3
Cot
Head
4
6'-6"
12"
5
Head
Cot
6
7
8
15'-0"
55# Wall Rad. in 2 Sec.
Bench
Lockers
5
6
7
8
12" ventilator
Locker Room
5'-0"
1
2
3
4
1
2
3
4
10'-0"
7/8" T & G Siding
4" Air Space
Wall Board
12"
27"
17"
Plan. of Ideal Army Barrack
SQUAD HOUSE
8 Men - Corporal and 7 Privates.
600 Cu. ft. Air Space per Occupant.
60 sq. ft. Floor Area " " .
6 " " Window " " " .
25 Cu. ft. per Min. Air Change " " .
Radiation Suffient to maintain 45° above outside.
No drafts at head of cots.
Designed By - W. J. Mauer
Engineer for
Chicago Commission on Ventilation
Scale 3/16" = 1'-0"
July 16, 1917
OH.

FIGURE 7—PLAN OF IDEAL ARMY BARRACK SQUAD HOUSE.

The barracks as described above will probably pass the test as outlined by Doctor Craig. This test, however, would prove no more than the taste of water would disclose the presence of typhoid bacilli.

SUGGESTED SPECIFICATIONS FOR ARMY BARRACKS.

Dr. Arthur Reynolds, former Health Commissioner of Chicago, gives some very valuable suggestions in his article on "Ideal Training Camps," which article appeared in the July, 1917, issue of *The Chicago Medical Recorder*. One suggestion is to limit the barracks to two men. There would be a lack of sociability among the men and for this and several other reasons the writer believes that a *Squad House*, caring for eight men (a corporal and seven privates) would be more desirable;

this number, however, should be the maximum.

The *Squad House* shall contain eight bunks with a separate room for wardrobe at one end and toilets at the other. It should not be necessary for a man to leave the building for toilet or washing purposes. There shall be windows on all four sides of the squad house. A detailed drawing of the squad house as designed by the writer is shown herewith. It will be noted that with the arrangement of windows, radiators and cots no man will be subjected to drafts at his head. The allowance of window space, floor space and air space per occupant is that which is necessary for proper housing.

The *Temperature* shall vary from time to time between 45° and 55° unless the outside temperature is below 10°, under which condition 40° above outside temperature shall be maintained.

Heat shall be supplied from a central steam heating plant, with a proper amount of radiation in the squad house to furnish the above temperature and still allow the windows to be opened sufficiently to supply at least 25 cubic feet of air per minute per occupant.

The following shall be a minimum allowance per occupant: 600 cubic feet of air space; 60 square feet of floor area; 6 square feet of window area.

Dust shall not rise to more than 5,000 particles per cubic foot.

Bacteria count shall not be over 4 on a 3½ inch Petrie dish exposed two minutes.

There shall be a 95 per cent freedom from *Odors*.

The *Windows* shall be double hung vertical sliding sash type, capable of being opened both at top and bottom so that the air may be introduced at a high point and may be thoroughly diffused before coming into the breathing zone.

The windows shall be on all sides of the building to secure a uniform *Distribution* of fresh air throughout the room. The sill shall not be less than 3 feet above the floor.

The *Cots* shall be uniformly distributed throughout the squad house and shall never be placed closer than 9 inches from any wall.

There shall be a separate room for the men's *Wardrobe* and a separate room for the *Toilet*, preferably at one end of the squad house, and care should be taken that the air supply to the sleeping quarters is not affected by these rooms.

All interiors shall be smooth finish and shall be *Painted* or *Limewashed* before occupancy and every three months thereafter.

Dust Pockets shall be avoided and care taken to keep the room free from dust and dirt.

The above scheme was worked out by the author and presented by him to the members of the Chicago Commission on Ventilation at their regular meeting on July 24, 1917, and received their unqualified approval.

THE CONTROL OF COMMUNICABLE DISEASES IN CAMPS.

MAJOR ISAAC W. BREWER.

Read before the Public Health Administration Section, American Public Health Association, October 20, 1917.

WE are now at war and a great wave of patriotism has passed over the country. Many people are making capital out of this war and we who are interested in the health of the people should not fail to capitalize this war to its fullest capacity. The enormous number of men who have been turned away from our army because of physical defects has called attention to the need of better things in the way of public health. We have before us, in the mobilization of this army, an unusual and very splendid opportunity for public health education. If we make the most of it the result of this war, as far as public health is concerned, will be good. If we fail to utilize the opportunity thus given, the public health movements of the country will lag as in the past. However, our education must, as far as possible, be logical in accordance with the best we know of the spread of the disease. My subject is on the control of communicable diseases in camp. A body of soldiers in camp offers an unusual opportunity for the control of diseases and at the same time soldiers living under these conditions are, to a very large extent, exposed to disease.

On table one are given the admission rates per thousand for the decade 1891 to 1900 and for each year from 1901 to 1915 for some of the communicable diseases which are common in the military service.

Measles.—During the decade from 1891 to 1900 the average admission rate was 10.91 per thousand. During the following decade it fell to 9.49 per thousand and, during the five years ending with 1915, it was 9.6 per thousand, a reduction of nearly 0.2 per thousand since 1900. Examining the individual year you will find that the rate varies greatly. For instance, in 1902 it was 14.41 per thousand. In 1908, it was 16.11 per thousand while in 1911 it was 17.29, the highest recorded during the period under consideration.

In the army the usual custom in checking an epidemic of measles has been to isolate each case as soon as it is discovered. The customs vary somewhat as to the contacts. In many instances they are placed in quarantine regardless of whether they have had the measles or not. In my sanitary work in the army during the past sixteen months, I have endeavored to handle this situation in what seems to me to be the more rational way. According to the studies made by Hill, it is probable that at the age of twenty years, 94 per cent of the men have had measles. The chances of the men having the measles a second time are not one in a hundred, therefore I feel that in handling an epidemic of measles, if we had a list of the men who have had the

TABLE I.

ADMISSION RATE PER THOUSAND OF COMMUNICABLE DISEASES IN THE UNITED STATES ARMY.

Year	Scarlet fever	Measles	Small pox	Mumps	Diphtheria	Cerebrospinal meningitis
Average, 1891 to 1900	0.14	10.91	1.06	7.24	0.55	0.26
1901	0.17	8.55	1.38	16.10	0.31	0.05
1902	0.22	14.41	1.30	15.80	0.26	0.07
1903	0.16	6.79	0.58	7.27	0.38	0.00
1904	0.00	14.42	0.34	10.23	0.19	0.00
1905	0.00	5.22	0.19	11.86	0.60	0.00
1906	0.00	6.41	0.27	17.91	0.30	0.09
1907	0.00	10.20	0.09	6.58	0.26	0.76
1908	0.00	16.11	0.23	12.22	0.92	0.26
1909	0.00	7.80	0.03	9.69	0.47	0.26
1910	0.00	4.96	0.21	3.65	0.85	0.14
Average	0.055	9.49	0.46	11.13	0.46	0.16
1911	0.10	17.29	0.07	14.46	0.63	0.00
1912	0.00	6.49	0.08	16.99	1.01	0.19
1913	0.00	6.44	0.10	7.85	2.98	0.43
1914	0.33	6.31	0.08	8.90	0.50	0.00
1915	0.74	8.71	0.05	8.02	0.88	0.36
Average	0.23	9.06	0.07	11.24	1.20	0.20

disease, we might very safely confine our attention to those who have not had the disease. If Hill's figures are correct, that would give us less than ten men per hundred to have under supervision. In some of the organizations that I have inspected the number of men who are not immune to measles by reason of a previous attack has been as low as 2 per cent. My custom is to parade the company in which the disease exists and make a hurried examination of every man, having him expose his chest and observing his eyes and mouth for symptoms of the disease. The men who have not had the measles are then separately paraded and their evening temperatures afterwards taken and recorded. The men having temperatures of not over $99^2/_5$ are examined again later on in the evening. Those who have temperatures above that are placed in isolation for three or four days until the danger of development of measles is past. The men who have not had the measles are kept under observation for fourteen days.

This plan has been carried out at Fort Ethan Allen, Vermont, during the recent mobilization of troops and, although we have had a number of cases of measles introduced by new arrivals, the disease has not spread beyond those who were first exposed except in the case of one regiment where the conditions were handled in another way and where the spread was probably due to faulty technique in the management of the cases. When this epidemic was brought to my attention, the plan here outlined was put in operation, and the disease rapidly disappeared. This plan produces a minimum amount of inconvenience for the organization as it interferes very little with their training and has proven to be satisfactory to the line of the army as well as to the medical officers of the post. The work of taking the temperatures can very readily be entrusted to a hospital attendant and the medical officers need not spend more than five or ten minutes per day on this work.

Diphtheria.—The admissions of diphtheria in the army for the decade 1891 to 1900 was 0.55 per thousand. During the following decade it was 0.46 per thousand. During the last five years the admissions amounted to 1.20 per thousand. Examining the individual more closely, we find that the disease was more prevalent during the years 1912 and 1913. It is a well known fact that, although by the use of antitoxine we have been able to reduce the death-rate from diphtheria, most of our efforts to control the disease have been without avail. This is probably because of the large numbers of carriers in the general population. In my work in the army, I have endeavored to search out the carriers whenever a case of diphtheria appeared and I feel that the time and efforts expended on this have resulted in a considerable reduction of the cases. As soon as a case is reported as a suspect, I immediately get in contact with the other men who live in the tent or in the same squad room with the suspected case. Their throats are examined and those showing enlarged tonsils or symptoms of inflammation are isolated. Cultures are taken from all of the intimate contacts. This has resulted in the discovery of a number of carriers. In one outbreak that occurred in Texas about a year ago, I found in one regiment several carriers. All of these men were taken into the camp hospital and placed in isolation until negative cultures were obtained from their noses and throats. At one time we had in that hospital something like twenty-seven men who showed positive diphtheria cultures from their noses or throats. Not more than a half dozen of these had positive symptoms of the disease although most of them had enlarged tonsils. Those with diseases of the tonsils were operated upon and the others were treated by a number of different methods, the details of which I have not at hand at the present time. Strange as it may seem, all of these cases cleared up and were eventually discharged as cured of the disease. My present efforts for the prevention of diphtheria in this command consists of the following: At the semi-monthly physical inspection I have had the examining officers make lists of all men having enlarged tonsils. The tonsils in these cases are being removed as rapidly as possible, if the surgeon deems it advisable to do so, with the patient's consent. We have, by accident, found two positive cases of diphtheria in the command during the past six months and in both instances the infection resided in the tonsils and an operation resulted in a cure. We have also had one epidemic of Vincent's angina which was due to a carrier with enlarged tonsils. Removal of them also resulted in a cure. We did not have the facilities for determining the virility of the germs in any of these cases. The Schick test should be used where possible.

Cerebrospinal Meningitis.—During my service in the army, I have had two experiences with cerebrospinal meningitis. The first occurred in 1899 and I had an opportunity of studying the pathology and the bacteriology of the disease with Dr. R. P. Strong. At that time very little was known of the method of spread and our efforts to control the disease were without avail. At about the height of the epidemic the troops entrained for San Francisco and only one additional case developed after leaving the post. I have always felt that the change from very much over-crowded barracks to the somewhat well ventilated train had more to do with the prevention of the disease than those measures adopted by the Medical Department.

During the past summer four cases of cerebrospinal meningitis developed at Fort Ethan Allen, Vermont. Before I knew of the first case, the entire organization to which the sick man belonged was placed under quarantine and an order was issued for the spraying of the noses and throats of each man with Dobell's solution. This was a very arduous undertaking and I felt at the time that very little was being accomplished. A few days later Major E. K. Dunham of the Rockefeller Institute arrived and he instituted measures of prevention which I think had a very decided effect upon the disease. He cultured all of the immediate contacts and found several who showed positive cultures. All of these contacts then had their noses and throats sprayed every two hours for eight hours with Dichloramine-T solution. These measures promptly sterilized the noses and throats of the men and there was no spread of the disease. We were unable to locate the original source of the disease but it seemed to me to be located amongst the troops at a certain portion of the garrison. Later, however, Dr. Amos informed me that further study of the cultures taken by Major Dunham showed that there were two distinct strains of the diplococcis, and it is probable that there were two carriers. Amongst the contacts of the first case was one man who had enlarged tonsils filled with a cheesy matter. It may be possible that he was the original carrier in the case. In cerebrospinal fever the point to emphasize is the treatment for the carriers and the sterilization of the noses and throats of all the immediate contacts with a solution of Dichloramine-T according to the formula of Major Dunham.

Scarlet Fever.—Scarlet fever is not a very large factor in the morbidity of the United States army. I think it should be controlled very much as measles, only the number of days of observation need not be longer than eight or ten.

Mumps.—Mumps cause the largest admission rate of any of these particular classes of disease. These are very difficult to control and the only method that has been to any avail, as far as I know, has been the isolation of such and quarantine the contacts.

In dealing with soldiers it should be remembered that his movements can be absolutely controlled and as a rule you have sufficient force and facilities for properly carrying on these lines.

PROPHYLAXIS OF INDUSTRIAL POISONING IN THE MUNITION INDUSTRIES.

Dr. Alice Hamilton,
Hull House, Chicago, Ill.

Read before the Industrial Hygiene Section, American Public Health Association, October 18, 1917, at Washington, D. C.

I MUST begin my paper with an apology. The subject assigned to me, as I understood it, was the protection of workers in the explosive industries against industrial poisoning, not those employed in all the varieties of work that make up the munition industry in general. Therefore, I am not prepared to speak of that very important industrial poison, lead, nor of brass, nor arsenic, nor antimony, nor carbon monoxide—all of them, of course, present in the manufacture of munitions. I can speak only of the making of explosives, and not even of all of those for I see, to my relief, that the two following speakers are to deal with trinitrotoluene, so that I can spend the time allotted to me on the other explosives.

Nitrous fumes, under which term we group the various oxides of nitrogen, are the elements most to be feared in all nitration processes, including the manufacture of nitric acid. In nitrating cotton, starch, phenol, benzene, toluene, anilin, naphthalene, chlorbenzene, and other substances, there is a danger, more or less great, of an accidental escape of such fumes into the air of the work place. In my experience this danger is greatest in the higher nitration of cotton by the so called pot method, and in certain methods of nitrating picric acid, and in making tetryl or tetranitromethylanilin. Always nitration involves the formation of nitrous fumes but when it can be carried out, as it is in nitrating benzene to nitrobenzene and toluene to trinitrotoluene, inside closed receptacles, the danger is only of accidental escape of fumes. When an open method is used, the attempt to catch and carry off the fumes after they have escaped into the room is very difficult, I should think impossible. When such methods are used, sudden, violent decomposition with the evolution of dense fumes may bring about a most dangerous condition for workmen.

Nitrous fumes are corrosive and the symptoms which follow inhalation are due to this corrosive action on the mucous membrane of the mouth, throat, larynx, bronchi, and in severe cases the finer bronchioles. Congestion and swelling result, then an outpouring of an exudate, and there may be laryngitis with edema, bronchitis with dyspnea from the great swelling of the mucosa, pneumonia, or that dreaded edema of the lungs, familiar to every physician who has had charge of men on the nitrating area. Along with these symptoms there may be involvement of the gastrointestinal system, sometimes quite pronounced, but the respiratory distress is so much more striking that it tends to overshadow all else. This form of industrial poisoning is so much like the gas poisoning in the trenches that the abundant medical literature on the subject of gassed soldiers might well be used for guidance in the treatment and in the prognosis of nitrous fume poisoning in industry.

Prevention of nitrous fume poisoning depends on the prevention of nitrous fumes. No respirator so far devised can serve to protect a man from these fumes, for more than a very short time. The sponge would have to be soaked in some neutralizing chemical and it would not be long before saturation occurred and the thing became useless. Helmets, of course, cannot be worn continuously, though it is recognized that helmets must be kept for emergency use in case of accidents on the nitration area.

Details as to methods of preventing fumes are impossible to give without making this paper unduly long. The more open the process, the greater the difficulty. If nitrated cotton must be dug out of the wringer and thrown into an open trough of water, there will be far heavier fumes than when this is accomplished by automatically discharging the wringer into a closed tank below. If picric acid is to be made by siphoning nitric acid into open pots of phenol, there will be much more danger than when the reaction takes place within closed nitrators.

But in nitration, as in the manufacture of nitric acid, no matter how well thought out the method is, accidents cannot be entirely prevented and they must be provided for. This means that access to the outer air must be easy from all parts of the nitrating department. In addition to the usual ventilation system there should be an emergency fan to suck out the dense fumes quickly. There must be an abundance of running water in case of acid burns. The workmen must be provided with some sort of mask, easily worn and adjustable in case of accident. I saw an excellent one in the du Pont plant at Hopewell. The men must be instructed in their own languages by a patient teacher who will take time to demonstrate what he is saying. Printed instructions on walls are doubtless valuable and many state laws require them, but even if the Italian or Slavic workman can read them he soon forgets and they cannot take the place of the spoken word. The instruction should include not only the ways to prevent and to deal with accidents, but the necessity of seeking medical care at once for even a slight case of fume poisoning. Every works physician knows how serious may be the consequences of imprudence following even mild fume poisoning.

Medical supervision is absolutely essential in nitration works and when, as is usually the case, there is no hospital near the works, a small hospital must be equipped on the grounds, provided with all that is necessary for the treatment of acid burns and "fume sickness." The doctor or his assistant must be within easy call.

In point of danger, I should put next to nitration (since I am omitting T.N.T.) the use of benzene and toluene, which may be treated together since they are so similar in action. These compounds are encountered in the distillation of coal tar, in the manufacture of phenol, and in the manufacture of nitrotoluenes and nitrobenzenes. They are powerful narcotic poisons, rapid in action, sometimes producing death in a startlingly short time. I found fourteen cases of poisoning from them in 1916 in the explosives industry and seven of these were fatal, but in none of the seven was the exposure to fumes apparently great. Four of the seven were working in stills which had been emptied and washed out before they entered. Another was exposed less than five minutes to the fumes from a leak, and the two last were in the sulphonating department of a phenol plant where fumes arose from a residue of unchanged benzene running out from the sulphonator into a hot liming vat.

Certainly the greatest possible precautions should be taken in connection with all such work and far more careful cleansing of stills and storage tanks must be insisted on before the men are allowed to enter them. Some employers require the wearing of helmets during repairing and cleaning.

I have not found serious poisoning in the explosive industry from anilin or from nitrobenzene, not because these are not powerful volatile poisons, but because so far they are not used much in this industry nor in such a way as to cause dangerous exposure. We are told, however, that if we cannot get a larger supply of toluene for the manufacture of T.N.T., we shall be obliged to turn to that older explosive, dinitrobenzene, and then indeed we shall need all our skill to prevent danger to the workers, for it is more poisonous than T.N.T. and acts far more rapidly.

Tetryl and T.N.A. are not as yet in general use in this country, though I believe that the use of the former is increasing. Tetryl is tetranitromethylanilin and is used in the form of powder, or fine crystals or pellets. It enters into the composition of detonators and is usually handled by women and girls. When I made my study of the industry last year I found no trouble from tetryl more serious than a more or less distressing dermatitis, but since then I have heard from an American physician of experience that he has seen amenorrhea follow exposure to tetryl, and just recently I read a report from England of the opposite condition, profuse or too frequent or too prolonged menstruation among tetryl workers. As its use increases in this country we shall have opportunity to test both these observations.

For all these nitro and amido derivatives of the benzene series the preventive measures must include strict cleanliness and protection for the skin, since the skin is the chief portal of entry. The British experts insist on full suits of overalls, with snug wrist band and neck, clean socks and shoes in good repair, impervious gloves and of course ample washing facilities. I suppose it is a question whether American workmen could be induced to wear such overalls in our hot summer weather but if they are allowed to work with bare arms and necks in an atmosphere with poisonous dust, they must be required to bathe at the end of each shift.

Making smokeless powder involves exposure to ether fumes and requires a strong down draft system of ventilation, for the fumes are heavier than air. Making and handling fulminate of mercury carries with it the danger of fulminate itch, and probably also of mercurial poisoning. Here the problem is one of dust prevention chiefly and of bodily cleanliness.

All these methods of prevention are such as would present themselves to every intelligent works manager after he has had experience with the poison in question, but there are certain less obvious methods of protection that are equally important. One is the avoidance of over-fatigue. To say nothing of the effect of excessive fatigue upon the health of the worker in general, its effect in the poisonous trades is very serious. Fatigue lessens resistance to the action of poisons. In England the tendency is to provide against over-fatigue among workers exposed to industrial poisons, not so much by shortening the time spent in the factory as by interrupting work frequently, by inserting rest periods. Our habit in this country is different, our workers are accustomed to concentrating their tasks into as short a day as possible. Which is the more healthful system it would be idle to ask, for it is certain that the English way could never be introduced over here; we shall have to prevent excessive fatigue by a short work day. During 1916 I found the eight-hour day, the three-shift system, in general use. Two twelve-hour shifts were exceptional. Let us hope that it will be possible to maintain that rule during the war. We must remember that since many explosives plants are built far out in the country, the fatigue of the day's work may often be increased by a long ride standing up in a crowded car.

The length of the working day is important not only with regard to fatigue, but also with regard to the amount of the poison ingested. Obviously the longer the hours spent in an atmosphere of dust and fumes, the greater the amount of poison absorbed. To put a man to work for many hours stirring molten T.N.T. or cleaning out pans encrusted with dinitrotoluene, or shovelling chlorbenzene, is to court disaster. Shortening the hours then becomes an essential part of the prevention of industrial poisoning.

Heat increases the liability to poisoning in two ways, by increasing skin absorption and, as Helmholtz showed long ago, by favoring the action of the poison just as it favors all chemical action. In our hot summer months special care must be taken in those departments where poisons are present. I have in mind two T.N.T. factories which, during the excessive heat of 1916, adopted contrary policies. The one shortened the hours, introducing four shifts in place of three, the other started working the men overtime and kept it up into September. This last had more than double the cases of poisoning in July that it had in June, and the August toll was even greater, while in the other plant there was no increase during the hot months.

The British lay great stress on the importance of abundant hot, wholesome food for those exposed to poisons, and I think all American physicians would agree with them. What they say of their workers is true of many of ours; they go to work in the morning after an insufficient breakfast and, therefore, ill equipped against poisoning, and the cold lunch carried to the factory is not nearly so good as a hot, well prepared meal. All British factories must now have what they call canteens, where hot food is sold to the workers, and in addition the employer is obliged to provide at his expense a pint of milk or of cocoa made with milk for each employee. Great pains have been taken by the Health of Munitions Workers Committee to work out proper dietaries and they have published full descriptions of these, with directions as to equipment, supplies, number of canteen workers needed, etc., for the instruction of the employer.

Medical supervision of employees exposed to poisons is an admitted necessity, yet I did not find it in force in all our factories in 1916 and some which were supposedly under the charge of a works doctor had no more service than was necessary to keep the company from troublesome claims for sickness, and death benefits. If medical care is to be adequate, the doctor must be actually in charge, not merely a consultant and not subordinate to the foreman. He must be responsible for the health of the men accepted for employment in these dangerous occupations; he must keep in close touch with them during their employment; he must know in which department a man sickened and what caused the sickness; he must see the men often enough to be able to pick out those not sick enough yet to come to him yet needing attention if they are to escape poisoning. He must also have the power to suspend from work or to shift to less hazardous work, and it must be for him to decide when a man once poisoned may return to his former job.

In this connection let me speak of the experience of some English works physicians in shifting a worker from a job which involved exposure to poison to one without this danger, but much more fatiguing or carried on in crowded, poorly ventilated quarters; such conditions have been known to actually precipitate the development of the latent poison, greatly to the discomfiture of the doctor who ordered the change.

We have not so far had to face the evil of immature labor in our factories making explosives and I hope most sincerely that we shall never commit the serious blunder of exposing boys and girls to poisons which, because of their immaturity, they are unable to resist. In all probability we shall employ increasingly large numbers of women in this industry but that does not seem to me to require any more precautions than does the employment of men except in cases where the poison is more dangerous to women than to men. This is, of course, true of lead, but I do not know of any poison in the manufacture of explosives that has a worse effect upon women than on men, unless it be tetryl. If the findings I have spoken of are confirmed, if it is proved that handling tetryl causes grave menstrual disturbances, then there will be reason to object to their employment in tetryl works. On the other hand it seems to me possible that women may stand better than men the ether fumes in pressing and cutting smokeless powder, for they are so much less likely to help the action of the ether by indulgence in alcohol.

I hope we shall follow the example of the English, not only in our precautions against industrial disease, but in the matter of frankness, of the scientific spirit that gives gladly to the world all discoveries, all the knowledge gained by study and experience. The English have laid before us without reserve the record of disastrous accidents accompanying their manufacture of explosives, and for us as for them the information is of the greatest value. It would be a pity if American physicians were held back by any motive from adding their quota to the growing mass of knowledge concerning these new industrial poisons.

◆

Nutrition and Malnutrition.—At the suggestion of the medical officer of the London Board of Education the subject of nutrition and malnutrition was included in the school medical inspections during 1916. The results are reported briefly in the *Medical Officer* for November 17, 1917. The children were graded into four groups: good, fair, poor, wasting. Only 1,099 London children or 0.4 per cent of those inspected were placed in the fourth group. The weights and heights of a group of these children showed an average deficit, in boys, of 4.7 kilograms and 8.9 centimeters from the normal average for their age, and in girls of 6.2 kilograms and 9.7 centimeters. Younger children were more affected than the older, and boys were slightly worse at each age, than the girls.

Generally speaking the nutritional state of the children corresponds with their social conditions. An analysis of two districts showed some interesting results. Lewisham is a typical residential suburban district and Bethnal Green is one where poverty and overcrowding are more prevalent. The following table shows the comparison:

PERCENTAGE IN EACH GROUP OF CHILDREN MARKED GOOD, FAIR, AND POOR.

	Younger Boys			Younger Girls		
	Good	Fair	Poor	Good	Fair	Poor
Lewisham....	67.1	30.0	2.9	67.6	29.8	2.6
Bethnal Green	9.0	58.4	32.6	8.0	72.2	19.8

	Older Boys			Older Girls		
	Good	Fair	Poor	Good	Fair	Poor
Lewisham....	75.3	24.2	2.5	73.3	23.7	3.0
Bethnal Green	7.9	66.7	25.5	11.7	69.9	18.4

A comparison of 250 Jewish boys at each of the ages of 11 and 13 as compared with 250 Gentile boys at the same ages, from the point of view of nutrition, showed the following results.

	At Age 11			At Age 13		
	Good	Fair	Poor	Good	Fair	Poor
250 Jews.....	97	112	41	83	139	28
250 Gentiles..	53	143	54	77	143	30

At the age of 11 the Jewish boys were considerably above the normal London average at 11 for weight, and still further above at 13, while the Gentile boys were slightly below the average at each age. With regard to height, however, the Gentile boys reached the London average at both 11 and 13 years, whereas the Jewish boys were slightly below the average at 11, and considerably above the average at 13. This would indicate that an important racial factor determined the rate of growth at each age, which also has an effect upon nutrition.

(*M. P. H.*)

WHAT WE ARE DOING TO PREVENT TUBERCULOSIS AMONG CHILDREN.

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Read before the Section on Public Health Administration, October 19, 1917.

Introduction.

THE activities of the Department of Health, in the prevention of tuberculosis, have many points of contact and closely interlock with those of various private agencies. Definite and self-reliant, in large measure, as the organization of the Health Department's activities have in the process of evolution become, an account of its preventive efforts that omits adequate notice of the correlated work of many private organizations would lack completeness and would fail to do justice to the many splendid achievements of these and other unofficial co-workers.

While on the face of them, certain branches of our work hardly seem to fit in with a description of preventive measures directed particularly against tuberculosis in children, they are none the less upon consideration closely related.

It is impossible to do more than briefly mention the various measures which the New York City Department of Health, in common with other health organizations, has adopted to combat tuberculosis among children:

1. The inspection and the control of the milk supply by the Bureau of Food and Drugs, from its sources to its ultimate points of distribution is not only preventive of gastro-intestinal diseases, typhoid fever, septic sore throat, and other infectious diseases, but of tuberculosis as well. Pasteurization of milk, now mandatory in New York City, is a preventive of tuberculosis among children.

2. The fifty-nine Baby Welfare Stations maintained by the Department of Health for the dietetic and hygienic guidance and supervision of infants are also of value from the viewpoint of the prevention of tuberculosis. There, however, is a gap which exists in our work from this point. The pre-school age is one during which no effective periodic system of medical examination is conducted. Carious teeth, hypertrophied tonsils and adenoid tissue, and malnutrition in children who are not yet of school age, are justly to be regarded with apprehension as predisposing to tuberculosis quite as much as in those children who are of school age and who alone are now the objects of our solicitude. Periodic medical examination, regularly throughout life, must inevitably become one of the chief aims of public health work.

3. Parents of children must be taught by the printed and spoken word to give special attention to securing proper treatment and aftercare for those who suffer from measles and whooping-cough, diseases which are notoriously predisposing causes of tuberculosis.

4. The work of the Bureau of Child Hygiene, which has as one of its chief functions the periodic medical examination of school children, may justly be regarded as perhaps the most powerful and effective weapon with which the Department of Health wages its preventive attack on tuberculosis among children. The Bureau examines annually approximately 300,000 of the nearly 900,000 school children in New York City, to say nothing of its periodic routine inspection of all these children. Largely as a result of the activities of this Bureau, 160 school

children who have a positive sputum are excluded from attendance at public school at the present time, thus removing an important focus of infection. This work has resulted in the correction of important, predisposing factors, namely, carious teeth, hypertrophied tonsils, adenoids, anæmia and malnutrition, etc., in a large army of children.

5. The Bureau of Child Hygiene also exercises a fairly close and constant supervision over about 2,000 children who have been exposed to tuberculosis, or whose physical condition is such as to make them susceptible to the disease. These children, as a result of the coöperation of the Department of Education and the Committee for the Prevention of Tuberculosis, have been placed in "fresh air" classes, more than 80 in number at present. If these are good for the under-nourished and feeble children, why are they not equally necessary for all other children?

6. Finally, the Bureau of Child Hygiene examines children between the ages of fourteen and sixteen years who apply for working papers. This is an important and potent means of sifting out from among other physical defectives those who appear susceptible to tuberculosis as well as those who give evidence of an already existing infection.

Once again a gap appears in the work of the department, because its opportunities for continued oversight of children, into whose hands are placed working papers, ceases forthwith. The Health Department's supervision is not resumed until, as too often happens, the child, grown to maturity, seeks medical and even charitable aid of the community for the treatment and care of tuberculous disease, that is often lighted up by the unsanitary factory and shop environment into which the child steps when it receives its working papers. It would seem urgently necessary that the Labor Law, or its administration, should be so modified that a child should secure permission to work, subject to periodic reëxaminations by the Health Department, at regular intervals, or when about to enter a new shop or industry, and supplemented by a rigid industrial hygienic supervision of shops and factories employing children.

7. The examination of public school teachers who give evidence suspicious of tuberculosis, though it has not as yet been made a routine procedure applicable to all teachers, as it should be, has resulted in the exclusion of a number of actively tuberculous teachers.

8. School lunches distributed free to malnutrition cases are chiefly valuable as a palliative, as being symptomatic, and as focusing attention upon existing economic faults with the attendant evils of poor housing, over-crowding, filth, lack of sufficient and of proper food, and ignorance. No health officer is equipped to plan a broad and balanced campaign for the prevention of tuberculosis in children or adults, who fails to take into his calculations the influence of these factors, and to seek to forward his public health work while at the same time making manifest the need for solving the underlying social problems, and helping to forward this social program.

9. The twenty tuberculosis clinics of the Department of Health provide a means for the diagnosis, treatment and instruction of exposed children in families where tuberculosis exists, of children who show a susceptibility to it or who give suspicious evidence of the disease, and to malnutrition cases as well.

We have at present the following groups of children under our care in these nineteen tuberculosis clinics:

Active cases of tuberculosis of all kinds....	1,335
Suspected or latent cases of tuberculosis...	1,337
Exposed children......................	8,437
Children with positive sputum...........	160 (all excluded from school)

It may be interesting in this connection to note that there was a total of 33,877 cases of tuberculosis of all kinds and in all age groups on register in 1917 in the City of New York. Of this number, the 29 clinics which by reason of their conformity to certain standards of diagnosis, treatment, nurses' service and equipment, comprise the membership of the Association of Tuberculosis Clinics, treated 13,533 or nearly 39 per cent of all the cases on record; 2,672 or roughly 20 per cent of these were children. Since the number of active and suspected cases of tuberculosis among children was only 2,672, it will be seen that clinical care of the nearly 8,437 other children who were exposed or undernourished was distinctly a preventive activity. Things will be more as they should be, when the nurses who do follow-up home visiting for tuberculosis cases or to predisposed children are no longer overburdened with clerical duties, and are permitted, and compelled when necessary, to make themselves at home long enough to actually nurse the sick whom they visit, to give comfort to the patient and instruction to the family in proper methods of caring for the sick, to advise as to the proper selection and preparation of food and also as to the elimination of sources of infection, and to advise as to sick-room and personal hygiene.

Whether a case of tuberculosis in a child is diagnosed as one of pulmonary or glandular tuberculosis with fine exactitude does not much matter. Increasing vigilance to detect from among children of *all* ages those whose physical condition or exposure makes them susceptible to tuberculosis is the important thing, and it is better to err on the side of extending preventive care even to children who are free from tubercular infection.

10. The Department of Health has equipped two ferryboats to care not only for adults who are unwilling, unable, or delayed in entering hospitals or sanatoria, but for exposed and infected children as well. It provides a nursery, school and playground, as well as a midday meal, luncheon, nursing, and clothing for the children. Between eighty and one-hundred children are taken care of in this way. It is a great expense, considering its limited value, that justifies itself with difficulty, and only as it argues powerfully for a movement to induce Y. M. C. A. and similar organizations, hospitals, dispensaries and public parks to devote roof or park space respectively, where practicable, to accommodate the relatively large number to whom the present camps are inaccessible; then the overhead expense for food, nursing and medical care would be well worth the investment.

11. Institutional care has been provided at the present time in special tuberculosis hospitals for 350 active cases in children by the Department of Health.

Of the 350 cases, 104 are suffering from surgical tuberculosis; 243 are suffering from pulmonary tuberculosis; 33 are arrested cases. Institutional facilities for children are ample.

12. The segregation and forcible detention in the Riverside Hospital of the Department of Health of about 200 cases of those who will not or cannot observe proper care in the home, or of their persons, is deserving of more general adoption as a means of removing a potent and pernicious source of transmission of tuberculosis to children and others.

Voluntary entrance of tuberculous adults into public institutions, which would be desirable from the point of view of prevention of the spread of the disease to the children, is not as frequent as it should be. In 1916 a total of 1,543 tuberculous individuals of all ages entered hospitals and 697 entered sanatoria. The reasons for this are important, as hospitalization of active, sputum positive cases is possibly the most valuable way of reducing to an irreducible minimum the number of foci of infection in the community, in the manner that General Gorgas described this morning (October 19) the reduction of the number of stegomia per acre as indispensable in the control of the spread of yellow fever. The elimination of each and every focus of infection is at present an unattainable ideal.

A certain number of patients will not stay in the best institution because of their desire for alcoholic and sexual indulgence, and because of their unwillingness to submit to discipline. The fight against alcohol is therefore not unrelated to the prevention of tuberculosis, and for a number of reasons that cannot here be printed.

Economic stress and the necessity to support the family keep many a wage-earner at work, and make him a source of danger in the home. Some day public health considerations, radical and visionary, as it may sound, will bring prominently to the fore some measures of relief, such as pensions or social insurance for the industrial soldier who is stricken in the line of duty.

Communities must primarily prevent tuberculosis by public health education and other measures of control, but until these become effective the problem of providing adequate institutional accommodations for tuberculosis carriers is a pressing one and a measure of prevention for children and others.

Finally, when we extol the architectural beauties and provisions a little less, and emphasize the necessity of satisfying, palatable and nourishing food and freedom from overwork for institution patients we will remove one of the causes that makes large numbers refuse to enter institutions, or to remain in them after they enter.

Private agencies have made available to our children the Preventorium at Farmingdale, and to our Catholic children the Nanuet Preventorium. Three hundred and twenty children are at present in these institutions for six months of reconstructive and defensive treatment.

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Study of Sanitation Urged for War Work.—In the *Boston Medical and Surgical Journal* for November 1, 1917, Professor Sedgwick of the Massachusetts Institute of Technology urges increased activity in preparing men and women for sanitary work in connection with the war. Opportunities are open for non-medical sanitarians such as sanitary engineers, sanitary chemists, sanitary biologists, and trained laboratorians, both in the Sanitary Corps of the Medical Department of the Army, and the Bureau of Sanitary Service of the American Red Cross. The question is also raised, whether the different schools that train men for public health and laboratory work, should not speed up, in order to turn out their product more quickly than usual.

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Tuberculosis in Dairy Cattle.—Prof. C. M. Hilliard says that although less than 1 per cent. of beef cattle are tuberculous, dairy cattle seem to suffer very much from this disease, particularly in the Eastern States. Thus, in New York, from 1910–1912, 19 per cent. of 39,330 cattle examined by the tuberculin test, reacted. During the last four years, about 11 per cent. of 29,000 tests on dairy cattle in Vermont, were positive. It is estimated that 30 per cent. of the cattle in Connecticut are infected, whereas the figure for Massachusetts is approximately 12 per cent. In other words, at least 10 per cent. of the dairy cattle supplying milk to infants, children and adults, are infected with a disease which is transmissible to man. The problem resolves itself under two heads. (1) The elimination of tuberculous cattle. (2) The pasteurization of milk.

The article appears in the *Boston Medical and Surgical Journal* for November 8, 1917.

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Medical Women and the War.—The National Medical Women's Association is attempting to obtain a list of all the medical women who can be relied upon for service in the war, should the need become apparent. The Surgeon-General of the Army is willing to place in base hospitals women physicians as anæsthetists, radiographers and laboratory workers. The need for laboratory workers is particularly keen at present and several courses have already been opened to college women in New York City and Philadelphia, to fit them as laboratorians.

STATE HEALTH DEPARTMENTS AND MUNICIPAL REFUSE DISPOSAL.

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Read before the Sanitary Engineering Section, American Public Health Association, October 18, 1917, at Washington, D. C.

IT is unnecessary, of course, to present any argument before a body of engineers to show that the collection and disposal of garbage is an engineering problem, but, judging from the methods commonly pursued by the governing bodies of our municipalities an educational campaign of considerable proportions must be carried on before the general public is made aware of the advantages to be gained by placing the question in competent hands for scientific study. As the matter now stands, the municipal health department is generally charged with the duty of enforcing the local garbage ordinance, if not with the actual work of collection. If the ordinance is wise in its provisions and the official in charge competent and active, fair results may be expected. But what was the origin of the ordinance and where did the supervising official get his skill and knowledge of methods? Undoubtedly both are the product of the exigencies of the local situation and perhaps each is as good as could be expected under the circumstances. But how much better might have been the result if the assistance of some central authority had been brought forward by the state at the proper time! It is probable that advice, based on experience to some extent, is available in most of the state departments of health, which might be made use of by municipal authorities if they knew of its existence. It is hardly to be expected that the official of a small community, elected for a short term and devoting but little time and attention to civic questions, will realize that the experience of similar towns may be obtained through the medium of some state department for his guidance in local affairs. The only way in which state assistance can be brought to the needy locality is by means of a state law, giving the state department of health supervision over the matter, and requiring certain duties of the municipality. Several of the states now have laws giving the state board of health supervision over sewerage systems and sewage disposal plants, which have been productive of much good in the elimination of nuisances and in protecting the public health by preventing the wholesale pollution of streams with untreated sewage. It would seem that a similar supervision over the collection and disposal of municipal refuse would result in valuable assistance to the locality in enabling it to solve its problems economically and in harmony with the best practice. If it did no more than to protect the municipalities from the unscrupulous vender of untried or worthless devices it would accomplish enough to justify its existence.

A state law should be framed with three objects in view: First, to collect and dispense information and the results of experience for the benefit of all communities in the state; second, to provide means of raising money to carry on the work; third, to see that sanitary requirements are met in the prosecution of the work.

For the collection of reliable information it is necessary that regular reports be required from all municipalities, that such reports be made in standard form as prescribed by the State Board of Health, that they describe fully the methods used, and that they contain accurate cost data.

It is probable that in most states the expenditures of the cities and villages are subject to certain restrictions prescribed by state law, taking the form of a limit beyond which a municipality may not bond itself, and in some instances local charter provisions prescribe how much money may be raised by direct taxation and specify what it is to be used for. In either of these cases it is not impossible that the cost of the collection and disposal of refuse may be lost sight of in the consideration of the more usual municipal expenses. The state law, therefore, should enable and even require the municipality to provide money for sanitary improvements as well as for pavements, ornamental lights, parks and the like.

In order to see that sanitary principles may not be violated in carrying on the work the law should require that the methods to be adopted and the specific plans of procedure must receive the approval of the state board of health before the work is begun. The statute should also give the board power to order such changes in equipment or methods as may be necessary to prevent nuisances or protect the public health or even to require the installation of an entire system if the local circumstances are such as to demonstrate its need.

As an illustration of the chaotic state of the important work of garbage collection and disposal which would probably be found generally throughout the country, the following summary of the situation in Michigan in 1914 is given in the belief that conditions have not since changed materially.

In July, 1914, return postal cards were sent out to 210 municipalities in the state asking the following questions:

Do you have a system of garbage collection?
If so, who pays for the service?
Does the collection cover the whole, or only a portion of the corporation?
How often, and by what means is it collected?
How and where is it disposed of?
In case you have no system of collection, what becomes of the garbage in your community?

Data regarding Municipal Systems:

Total replies received	158
No garbage system worthy of consideration	103
Collection is paid for by municipal tax	32
Garbage is collected by private persons and the collector paid directly by the patron	21
Collection covers the entire city	30
Collection covers only part of the city	22
Dispose of garbage by feeding to swine	9
Dispose of garbage by feeding part to swine and burying the remainder	2
Dispose of garbage by feeding part to swine and dumping the remainder	3

Dispose of garbage by dumping on land	12
Dispose of garbage by burning it on the dump	11
Dispose of garbage by burial (including plowing it into the soil for fertilizer)	18

Fifty-one municipalities report frequency of collection as follows:

Daily	2
Twice a week	7
Two or three times a week	20
Once a week	11
Every two weeks	1
Daily in business section, less frequently in residence	4
Once a week in residence, more often in business district	2
Once a week in winter, twice in summer	3
Once a week in business section, every two weeks in residence	1

Eight of the cities having municipal collection subsequently reported the percentage of population taking the service. The average of these eight is 60 per cent. Four cities having private collection reported an average of 28 per cent of the population taking the service.

The above figures bear out our previous observation that it is a fact that only a very small portion of the families have their garbage removed when they are compelled to pay the collector directly, and that the collection of garbage is much more general when its cost is spread upon the tax roll.

The collection of garbage is a community problem and affects the welfare of the entire municipality. Its cost should, therefore, be met by general taxation and every taxpayer compelled to assume his burden of the expense of keeping the city clean. It is of little benefit when one or two families in the neighborhood provide for the removal of garbage if their neighbors allow theirs to accumulate and become a nuisance and breeding place for flies.

Garbage, from its offensive nature, of course claims the attention of the municipality before the other waste products, but from the standpoint of the spread of disease, street cleaning is, no doubt, of first importance, and should certainly come within the scope of a state law enacted to cover all forms of city wastes. The lack of system and inefficiency noted above with regard to garbage collection and disposal would undoubtedly be found to apply to street cleaning were a similar investigation to be undertaken. To any one familiar with what is possible in this line the methods almost universally pursued are little less than disgusting and it would seem that state supervision is the only avenue by which material general improvement may be accomplished in cleaning streets with a minimum of cost and a maximum of sanitary efficiency.

PRACTICAL USES OF VITAL STATISTICS.

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VITAL statistics owe their existence to the commercial uses that have been made of them. In fact, vital statistics were called into being by the need of the practical information that they give, and their development into a separate science must be attributed to the increasing demand for data of the lives of the people for commercial, legal or other practical purposes.

While the greatest strides in the advance of vital statistics as a science have been made in recent years, their origin may be traced to centuries before Christ. Indeed, Herodotus tells us of a census of Egypt taken about 3050 B. C. for the purpose of making arrangements for the construction of the Pyramids. Elsewhere, this same author refers to a second census, taken about 1400 B. C. in Egypt by Rameses II, for the purpose of reapportioning all the land of Egypt among his subjects. The Bible tells us that Moses counted the tribes of Israel to determine their fighting strength and that David, about 1018 B. C., took a census for the same purpose. There is a record of a census taken in China about 1200 B. C., when data of the provinces was collected by Uking.

The first censuses made at regular intervals, of which we have a record, were taken in Rome after Servius Tullius. These were the most accurate enumerations of the population made in early times. About this period too, the residents of Rome were required to register births and deaths at certain temples in the city. It is probable that the purpose of this registration was to enable the civil authorities to determine the population of the city during intercensal years, as well as to have accurate data of the births and deaths occurring within the city, for legal and military purposes. It is even within the realm of possibility that the causes of death were studied from a sanitary viewpoint.

During the Middle Ages, enumerations were made from time to time, always with some specific purpose in view, which usually had to do with determining the fighting strength or the wealth of the nation taking the census. Particular mention is made in history of censuses taken by Charlemagne, William the Conqueror, Emperor Frederick II of Germany, and Edward II of England.

Sweden, about the middle of the seventeenth century, made it compulsory for the clergy to record not only the births, marriages and deaths, but also the populations of their parishes. The specific purpose of this registration is not disclosed. In Quebec a periodical census was established in 1665 and was continued until 1754. This was probably the first modern census.

The decennial census, which is an American institution, was brought into being by the provision in the Constitution for representation in Congress. The first one was taken in 1790 and was probably the first census in the broad sense of the word. The following is a quotation from the Encyclopedia Britannica:

"Sweden, Norway, and the United States are the only countries with any claim to have taken the first modern census, as distinguished from a register of taxpayers, etc. The lineal descendants of the old Roman census and the innovation seems to be due to the United States. If so, the first modern census was the American census of 1790."

In Great Britain, the first census was taken about 1801. The Encyclopedia Britannica states that:

"It was thought desirable to possess the means of judging from time to time the relations between an increasing population and the means of subsistence."

The same authority attributes to the essays of Malthus the desire for this information.

A triennial census was established in Germany in 1883 when it became necessary to have trustworthy enumerations of the population in order that the proceeds of the tariff might be justly divided according to the population.

It is, therefore, evident that the first vital statistics of which we have a record were enumerations of the population made for some practical purpose, *e. g.*, to determine the number of males available for military duty, to estimate the budget that could be collected through taxes, etc., etc. Save in Rome, after the time of Servius Tullius, we find no record of compulsory registration of births and deaths until rather recent times. In fact, today, in many parts of the United States, there is not an adequate system of registration of deaths, births and marriages.

Before the establishment by the federal bureau of the census of the registration area of births and deaths, the only means that the federal government had of securing mortality statistics was by including in each census an enumeration of the deaths that occurred during the previous year. I quote as follows from the published report of the ninth census, 1870:

"The dimensions attained by the life insurance interests within the past few years make it peculiarly a matter of regret at the present time that the census should not afford the data for determining with absolute precision and certainty the death-rate of the country, whether in the aggregate or by classes of population. This can never be done without a national scheme of registration, stringently enforced by penalties."

The first record of deaths in the City of New York is a list of persons who died of yellow fever in 1795, compiled for the purpose of sanitary investigation. In 1798 the deaths were recorded in a more or less careless manner because permits for burial were not issued by the city authorities, the certificate of death issued by the physician in attendance being presented by the undertaker to the keeper of the cemetery at the time of burial. The cemetery superintendents were charged with the duty of returning the certificates to the City Inspector's Department. That they discharged this duty in a rather unsatisfactory manner can be gleaned from an examination of the old records. Later, permits for burial were issued by the City Inspector but little if any improvement in registration of deaths was effected by this procedure as is evidenced in the following extract from the report of the Metropolitan Board of Health of 1866:

"The registration of deaths in New York City dates back to the year 1803. Cemetery records, and the returns of certificates of death through the cemetery-keeper or sexton, until within the last twenty-three years, supplied the information of deaths to the City Inspector. And until the adoption of new regulations, last spring, serious irregularities prevailed. *The frequent application for transcripts of death-records, which had never been registered, led to inquiries that confirmed and solved the question of incompleteness in the public registry.*

"The Metropolitan Board of Health has heartily sustained its Bureau of Vital Statistics in maintaining that "considered physically, the main objects of a correct civil registration of births, deaths and marriages, is to aid in disclosing the causes of disease; that, considered legally, the object is to provide means of tracing descent and proving personal identity; and that, considered politically, it is to assist the government in arriving at correct conclusions with regard to measures of internal economy, employment, etc."

The authorities, realizing that such slipshod methods afforded ready opportunity of concealing homicide and suicide, changed the procedure so that permits for the burial of human remains would be issued only by the Registrar of Vital Statistics or his duly authorized representative, upon the presentation of a proper certificate of death. We quote from the report of 1866 as follows:

"In no other city in the world did greater need of such systematic and rigid rules exist. I am happy to state that no opposition has been shown to this rigorous system, though until the Metropolitan Sanitary Board ordered it into operation, the City Inspector's permits were to be had for the asking—ready signed and in quantity—at the shops of various undertakers and medicine venders in the different sections of New York City. Such a premium on the daily violations of the statute relating to interments and the sanctity of human remains was not to be tolerated; the Board of Health and its Bureau of Vital Statistics could not allow that vicious system to continue for an hour. The metropolitan police quickly gathered up and brought to headquarters all those unguarded burial permits. There were other and very gross evils connected with the custody and registration of the dead, which were promptly corrected."

The demands for transcripts of death certificates for court proceedings and for the collection of life insurance, also for the settling of estates, undoubtedly was an important factor in improving the registration of deaths. The first quotation from the report of 1866 refers to the influence upon registration by demands for transcripts.

The registration of births and marriages became compulsory in 1847, but as no penalty was provided for violation of the law, it soon fell into disuse. The necessity of providing a penalty in order that the law might successfully accomplish the purpose for which it was enacted became apparent, and after a period of several years the law was amended providing an adequate penalty. This amendment became effective on July 1, 1853, and after that the births and marriages were reported with a fair degree of regularity. We can assume that the need of complete registration of births and marriages, as well as deaths, was realized at least by the officers of the Board of Health because frequent reference is made to the matter in their reports. The following is an example of such reference:

"The state and the municipality open their account current and ledgers of the life, lineage, death and the causes of death of the people, in order that the laws of healthy existence and social welfare may be elucidated, while public registration is made of three great landmarks which nature has placed in the pathway of life. And if, in the transactions of trade and transfer of lands and estate, the civil government justly demands the formalities of deeds, of title-proofs, covenants and solemn oaths, and the literal registration of them, how much more and with what exactions shall the requirements of society be enjoined in regard to its care, study, and public records of man in his birth and lineage, his family, his offspring, and his death."

The biggest impetus was given to the registration of births when the Department of Education found itself unable to accommodate all the children that clamored for admission to school, and in order to reduce the number as far as possible, made a ruling that children would not be admitted to school until they had presented a birth certificate proving that they were of school age. Numerous other demands for transcripts of birth, which are outlined in the following paragraphs, awakened the public to the necessity of having their children's births registered and created public opinion to uphold the recommendation of the Registrar, Dr. William H. Guilfoy, that all physicians and midwives violating the law be vigorously prosecuted. The adoption of this recommendation by the Department of Health has improved the registration of births in the City of New York until at the present time it is practically 100 per cent perfect. For this enviable record Doctor Guilfoy deserves credit.

Among the commercial uses of statistics in the City of New York, the following are the most common:

1. In Surrogates' Courts as proof of age and legitimacy of heirs. This is probably one of the most important legal uses of a birth certificate. Very recently in a case in this city in which many millions were involved, a birth certificate of the only heir was the most important evidence in defending an action to break the will on the ground that the heir was not born to the wife of the deceased but was a foundling which she had foisted upon him for the purpose of securing control of his entire estate at his death.

2. In Criminal Courts:

(a) To determine whether a minor defendant shall be tried in the Children's Court or in General Sessions.

(b) As proof of age of the complainant in cases of rape.

(c) As proof of birth in bastardy proceedings.

An interesting example in this connection of the value of a birth certificate to a person other than a child or its parent recently came to our notice. A young foreigner was arrested on a charge of bastardy and as he was unable to supply bail he was confined to jail until his case was called. The attorney who was assigned by the court to defend him applied to this department for a transcript of the record of birth of the child in question and was pleasantly surprised to find that the certificate showed the child to have been born in lawful wedlock to the husband of the complainant. It is needless to add that the complaint was dismissed.

3. In Civil Court:

(a) As proof of age in order to determine the validity of a contract entered into by an alleged minor.

(b) To determine the liability of a parent for the debts of a minor.

(c) In accident cases to determine the age of persons injured when the casualty company carrying the risk sets up the defense that the injured was under the age of persons permitted in their contract with the defendant to operate machinery.

4. Miscellaneous Uses:

(a) To settle disputes as to age arising out of insurance claims.

(b) As evidence upon which to correct a record of marriage or of death, particularly as to age.

(c) As evidence of legal age in order to obtain a marriage license.

(d) As evidence of age in order to enlist in the army or navy.

(e) As evidence of under age in order to obtain the discharge from the army or navy of boys who have enlisted without their parents' consent.

(f) As evidence of school age to gain admission to school.

(g) As evidence that a child is over 16 years of age and, therefore, does not require a permit to work.

(h) As evidence of the required age in order to obtain employment certificates between the ages of 14 and 16.

(i) As evidence of age and citizenship in order to obtain entrance to civil service examinations.

(j) As proof of citizenship in order to vote.

(k) As proof of citizenship in order to obtain a passport. This last need of a birth certificate has been forcibly brought home to us during the present European war by accounts brought to us of hardships and dangers suffered by many Americans because of the failure of medical attendants to record their births. Indeed, several Americans arrested as spies were saved from imprisonment and possibly death only by proving their American citizenship by means of birth certificates obtained from this department. Had the physicians who attended at their births been neglectful of the important duty of reporting their births there is little doubt that their lives would have been forfeited because of such negligence.

(l) The Widows' and Orphans' Pension Law, which has just been enacted, has created a new demand for certificates of birth.

5. In health administration, birth returns, in addition to their statistical value, are almost indispensable in infant welfare work since they enable the health officer to get in touch with the mothers of infants within the first few weeks of life for the purpose of instructing and aiding her in the care of her child. Firms engaged in the manufacture of maternity supplies and of clothing, toys, carriages, furniture, foods, and other articles for infants are alive to the opportunities that birth returns furnish of getting in touch with a clientele interested in their products. In this city the law makes the birth reports confidential and for that reason such concerns are refused access to the records. In many communities, however, the birth records are open to the public and concerns such as those we have mentioned avail themselves of the opportunities which they offer.

MARRIAGE RECORDS.

In the Supreme Court:

1. In proceedings for divorce or separation the marriage of the complainant to the defendant must be established.

2. A record of a second marriage contracted while the first is yet undissolved is prima facie evidence upon which may be granted a decree of divorce of the first marriage.

3. As evidence of a previous marriage from which the defendant has not been released by divorce or death, in proceedings to annul a subsequent marriage.

In the Criminal Court:

1. As evidence of bigamy for the purpose of prosecution.

In the Surrogate's Court:

1. As evidence of marriage in order that a widow may obtain her lawful share of her husband's estate.

2. To prove legitimacy of heirs.

Miscellaneous Uses:

1. As evidence upon which to correct the civil condition of the deceased in a record of death.

2. As evidence of a widow's right to pension, under the Widows' and Orphans' Pension Act.

3. As evidence upon which a widow may obtain compensation for the death of her husband, as provided by the Workman's Compensation Act.

4. As evidence of the right of the widow of a soldier, sailor, policeman or fireman to receive a pension from the federal or local government.

5. As evidence upon which to change the record of birth of an illegitimate child. It is customary in the Department of Health of the City of New York, when the parents of an illegitimate child subsequently marry, to permit them to file a certificate of birth of such a child, from which it shall appear that the child is legitimate—as it becomes after the marriage of its parents under the provisions of the Domestic Relations Act.

DEATHS.

Transcripts of deaths are used:

1. In the Surrogate's Court as evidence of death in probating a will.

2. As evidence of death of a parent in applications for appointment of a guardian.

3. As evidence of death of an heir.

In the Civil Court:

1. As evidence of death in accident cases.

2. To explain the non-appearance of a witness.

In the Criminal Court:

1. As evidence of the death of a defendant in order to secure the discharge of the bondsman who has given bail for his appearance.

2. As evidence of death in order to have an indictment against the deceased dismissed.

3. As evidence of death in prosecution for homicide.

Miscellaneous Uses:

1. As evidence upon which to collect insurance upon the life of the deceased.

2. As evidence of the cause of death in order to collect accident insurance on the life of the deceased.

3. As evidence of death of a beneficiary in applications to change the beneficiary of an insurance policy.

4. As evidence upon which to collect bank deposits of deceased persons.

5. As evidence of death of a subject ordered to report for military duty by those foreign governments which compel their male subjects to perform military duty.

6. As evidence of death in applications to the police department to remove the picture of the deceased from the Rogues' Gallery.

7. As evidence of death to be submitted to a city or other governmental department which has been paying a pension to the deceased.

8. As evidence of death to be submitted to the Workmen's Compensation Commission.

9. As evidence of death of civil or other pensioners in order that their widows or dependents may be granted one in its stead.

10. As evidence upon which to secure a widow's and orphan's pension.

11. As evidence of death of an illegitimate child in order that the father may be released from further payments for its care.

We have considered the past and present commercial uses of vital statistics, let us now see to what further uses the statistics of the lives of our people may be put.

In discussing the uses of statistics of mortality, the fact that life insurance, as a business, is absolutely dependent upon mortality statistics was not mentioned because the mortality experience upon which the life insurance companies construct their life tables and compute their charges are the mortality rates of their own clientele. But, if life insurance companies can amass fortunes for their stockholders, erect palatial buildings, pay large salaries to their officers and commissions to their solicitors, engage in social work, maintain permanent health exhibits, and engage in divers other activities requiring the expenditure of vast sums, by making practical and profitable use of the statistics they accumulate, why cannot cities and states likewise make practical use of their statistics and insure their residents against illness, accident and death. Not only should it be possible to do it at a saving to the public, but it should be possible to make sufficient profit to maintain the Health and Charity departments. At this point let us digress in order to express it as our conviction that these two departments should be consolidated as a Department of Public Health and the term "Charity Department" eliminated, for in the light of our present ideas it cannot be considered charity for a community to care for its ill, its aged and its poor, for if the social and economic life of our communities were properly organized, there would be none who could not care for himself or herself in illness and old age. Nor should it be considered charity to provide for orphans and foundlings. On the contrary, they are among the most valuable assets of any community and it is but the wisest and best paying investment to see to it that their up-bringing and education is such that they will mature into healthy and, therefore, useful citizens.

The age of individual effort is past and we have entered upon one of coöperation; therefore, the care of our orphans, our ill, our aged and our poor might well be undertaken upon a coöperative plan until we have realized that Utopia where there will be no dependents.

Before proceeding to a consideration of any plan, let us first rid our minds of the old-fashioned notion that the function of a health department is or can be limited, now or in the future, to detecting and isolating persons ill of contagious diseases, correcting sanitary violations, or similar activities that formerly were thought to comprise the duties of an efficient health department.

Today we know that the salary a man receives has the most important bearing upon his own and his family's health, both mental and physical. His income determines the character of the premises in which they live, the quantity and quality of their food, the sufficiency or insufficiency of their clothing, the enjoyment of wholesome pleasures, and a hundred other factors that have a most direct bearing upon their good health and, consequently, upon their resistance to disease and their efficiency as workers. Likewise, the worker's earnings determine whether he shall be able to accumulate sufficient savings to care for himself in the event of illness and to provide for his old age. It is, therefore, apparent even to the casual observer that all these social and economic factors have a most direct bearing upon public health and are, therefore, matters that should be under the jurisdiction and control of the Department of Health.

The following conditions are indispensable to public health: a living wage; clean and well ventilated rooms; sufficient, wholesome food, properly prepared; adequate clothing; opportunities for relaxation in the form of wholesome amusements; prompt and efficient medical care and nursing during illness; sufficient revenue during illness, whether from accident or disease, to maintain the home.

Therefore, the major functions of a Department of Public Health should be:

First: To assist in securing a living wage for the worker.

1. By improving his health, which, of necessity, will increase his efficiency and, therefore, enlarge his earning capacity.

2. By urging educational authorities to provide practical courses of study that will develop the bent of each child, and, therefore, increase the productiveness of our future citizens.

3. By advocating that the worker be given his just share of the profits that his labor produces.

Second: To provide proper housing at home, in the shop and factory. This can probably be best accomplished by including within the organization of a Department of Public Health a Bureau of Housing which shall be charged with all duties relating to housing, whether tenement, dwelling, hotel, factory, office building, or department store. In this connection the idea suggests itself that taxes be reduced or eliminated on tenements renting at less than four dollars per room per month, provided they meet standard requirements, to be determined by the Department of Public Health. It might be possible in this way to induce capital to invest in model tenements, of which there is an urgent need in New York today.

Third: To care for the ill. This function can be efficiently and economically discharged only by placing all the hospitals of the city under the direct control and supervision of the Department of Public Health. Attached to each hospital there should be an outdoor service which should include an adequate nursing force. Efficient ambulance service should also be provided and should be under the direct control and supervision of the Department of Public Health. Ambulances should serve all the hospitals of the city, each hospital being assigned a certain district. This would put an end to the present system of leaving it to the discretion of the hospital as to whether they maintain an ambulance service or not.

An important advantage of a city wide hospital bureau under the control of the Department of Public Health would be that the training school for nurses would also be city wide and the Department of Health hospitals would share in the services as well as in the teaching of the student nurses, thus increasing the practical work and training of the nurses and improving the services of the Department of Health hospitals without additional expense to the city.

Fourth: To care for orphans and foundlings. That children are foundlings or orphans makes them no less valuable to the state if they grow into manhood and womanhood, healthy in mind and body, and no less a burden if they become mental and physical defectives. Therefore, their care should be centralized in the Department of Public Health and the institutions to which they are entrusted should be located, as far as possible, outside the city limits in order that they might secure all the benefits accruing to children raised in the country.

Fifth: To provide suitable homes for the aged poor where they can be decently housed. The Farm Colony probably best solves this problem, combining as it does the advantages of outdoor life and the opportunity for making practical use of such labor as the inmates are able to perform.

Sixth: To accumulate data of the lives of the people that will enable the Department of Public Health to properly direct its activities and to compute the cost of compulsory insurance against accident, illness and death. In this connection it might be mentioned that the Department of Health of the City of New York has accumulated mortality statistics for more than one hundred years and from these statistics, together with the census enumeration of the city, the department recently constructed life tables of the citizens of the city, and is, therefore, in a position to compute life insurance rates.

It seems reasonable to suggest that the city could afford to insure its residents against illness and death at premiums lower than those offered by any insurance company in existence today and still make a profit sufficient to maintain a Department of Public Health. Such a system would impress upon everyone the value of one's own health and life and, furthermore, it would give everyone a direct and monetary interest in the health and life of every other resident of the city, as well as in the efficient management of the Department of Public Health. It would seem that in this way the hearty aid and coöperation of everyone could be obtained.

A program such as the one here outlined may seem utopian and possibly socialistic, but just as we have advanced from that era of public health work when stagnant water was thought to be the cause of typhoid and night air the cause of malaria, so too must we come to this broader realization of our duties as a community and, accordingly, extend the functions of our Department of Public Health.

COMPARATIVE WASSERMANN TESTS WITH TWO ANTIGENS.

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New York State Department of Health, Division of Laboratories and Research.

Read before the Laboratory Section, American Public Health Association, October 20, 1917, at Washington, D. C.

A GREAT deal has been said and written concerning the relative merits of various antigens used in the performance of the Wassermann test. Wassermann's original saline extract of syphilitic tissues, Noguchi's acetone insoluble fraction, crude alcoholic extracts of normal tissues, and cholesterinized extracts of normal tissues have been among the most frequently used by different investigators. Within the last few years a number of serologists have confined themselves to the last two mentioned antigens and many interesting articles have been published concerning the results of their tests.

At the inception of the sero-diagnostic work three years ago in the state laboratory, it seemed to us that, considering the variability of results obtained with the Wassermann antigens, even when these antigens were made by the same method, the use of at least two antigens would constitute a valuable check on diagnostic tests. Accordingly, the director required that two antigens made after two different methods be used for every specimen of serum received for the Wassermann test. This requirement removed to some degree the possibility of error in losing a reaction with a serum from a syphilitic which might be too deficient in antibody content to give a reaction with one antigen, but which might give the reaction with a more sensitive antigen.

One also finds that a certain percentage of sera may give doubtful or non-specific reactions with very sensitive antigens such as those containing cholesterin; so that antigens made with and without this constituent would seem to complement each other more nearly than those made by other methods.

Not only was the central laboratory required to use two antigens for diagnostic tests but also laboratories throughout the state which coöperate with the state laboratory were requested to observe the same precautions.

For the past three years we have tested in the state laboratory more than 25,000 sera with antigens made after two different methods; one a crude alcoholic extract of beef heart, the other a cholesterinized extract of guinea pigs' hearts.

The following report is based on a tabulation of those tests which were made in 1916.

More than ten thousand specimens were received during 1916 by the Department of Serum Diagnosis for the Wassermann test; 9,394 of these specimens were tested with the two antigens. Occasionally specimens were received which contained too small an amount of serum for two tests. A number of spoiled or otherwise unsuitable specimens were also received on which no tests were made.

The anti-sheep hemolytic system was used and the pooled sera of at least three guinea pigs. All reagents were standardized daily, and patients' sera and antigens were carefully controlled. In the case of the crude alcoholic extract of beef heart complement was fixed at ice box temperatures of 8° to 10° C. while with the cholesterinized extract of guinea pigs' hearts fixation took place at a water bath temperature of 37° C.

Readings were made according to the method advocated by Citron. After the tests were read the results were carefully compared with the histories of the patients which are usually quite complete and on those sera which had given paradoxical reactions (of which there were comparatively few) tests were repeated on the following day to make sure that such reactions were not due to a technical error.

The results with eighty-one per cent of the tests coincided. Twenty-nine sera were positive with the crude alcoholic antigen and negative with the cholesterinized antigen. Twenty-eight were positive with the cholesterinized antigen and negative with the crude alcoholic antigen, one showing no advantage over the other in this particular.

Of those positive with the crude alcoholic antigen and doubtful with the cholesterinized antigen there were 314 against 165 giving a positive reaction with the cholesterinized antigen and a doubtful reaction with the crude alcoholic antigen. The latter antigen thus gained 190 per cent more positives in this class of reactions than did the cholesterinized antigen.

The greatest variation in results was in the number of slight or doubtful reactions with the cholesterinized antigen which were negative with the crude alcoholic antigen. Of these there were 1,113 or 12 per cent of the total tests made on the same specimens of serum. The above results are compared in Table I.

Basing the percentage of positive, negative and doubtful reactions on those obtained with each antigen taken separately we find that approximately 24 per cent of the sera were positive with the crude alcoholic antigen as against 22 per cent with the cholesterinized antigen. Sixty-seven per cent were negative with the crude alcoholic antigen and 57 per cent with the cholesterinized antigen. Eight per cent were doubtful with the crude alcoholic antigen and 20 per cent with the cholesterinized antigen.

TABLE I.

Comparison of Results of Wassermann Tests with Two Antigens.

		BIII*		
		Pos.	Neg.	Doubt.
FI*	Pos.	1917	28	165
	Neg.	29	5231	98
	Doubt.	314	1113	499

Read horizontally the figures refer to the results obtained with FI.

Read vertically the figures refer to the results obtained with BIII.

*BIII Crude alcoholic extract beef heart, FI Cholesterinized extract guinea pigs hearts.

TABLE II.

Percentage of Results Obtained with Both Antigens.

	BIII	FI	Per cent	
			BIII	FI
Positive	2260	2110	24+	22+
Negative	6372	5358	67+	57+
Doubtful	762	1926	8+	20+

These results are presented in Table II.

It has been frequently demonstrated by many serologists that no two lipoid extracts made after either of the two methods described above or any other methods are ever quite alike. It is the usual custom to try out a new antigen in as many comparative tests with a standard antigen as possible before placing any dependence upon the results obtained with it. It should as nearly as possible approximate the results obtained with the standard antigen. We, therefore, feel that since these variations exist, reports on Wassermann tests performed with two antigens may be more safely made than reports on those performed with but one antigen.

Confirmation of the result of a test with one antigen by an equivalent reaction with another is also of great value where no clinical evidence can be secured.

In our experience the crude alcoholic antigen with the ice box method of fixation has given the most reliable results with the majority of the sera tested and also in those cases where paradoxical reactions occurred, although the cholesterinized antigen, if used with the care which its anticomplementary quality demands, will give satisfactory results and is of value in demonstrating the success of anti-syphilitic treatment and for other comparative purposes.

We consider a cholesterinized antigen exceedingly unsafe to use if the results obtained with it are not controlled by those obtained with a crude alcoholic antigen.

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DIPHTHERIA IN COURT BIBLES.

Homer N. Calver,
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KISSING has before this been condemned by many as dangerous—certainly, that is, from a sanitary standpoint. Yet one of the oldest laws in the State of North Carolina makes it obligatory in certain instances, namely for those taking oaths. This law says "Judges and Justices of the Peace and other persons who may be empowered to administer oaths shall require the party sworn to lay his hand upon the Holy Evangelists of Almighty God in token of his engagement to speak the truth—; and he shall kiss the Holy Gospel as a seal of confirmation to the said engagement." Such a manner of taking oath has undoubtedly a strong psychical effect and may in many instances decide the question of truth in the mind of a court witness. For it is in court that probably the majority of these oaths are administered. Nevertheless, even this form of kissing would seem to be an excellent manner of transmitting certain diseases.

With the object in view of obtaining some evidence in support of this theory a few cultures were made from the Bibles used in the two courts in this city. The cultures were made on tubes of Loeffler's blood-serum media or on blood agar by rubbing a sterile swab moistened in sterile water over a portion of the outside of the Bible and inoculating the media therefrom. All swabs were taken immediately on adjournment of the municipal or the county court and those in the former made on Monday mornings when there is generally an unusually heavy docket. After incubation for from twenty to twenty-four hours smear diagnoses were made. All smears being stained with Kinyoun's stain, this stain bringing out even better than Loeffler's the granular characteristics of the diphtheria bacillus. Both the media and the stain therefore were devised to show diphtheria if present, and the finding of this organism was in truth the principal result of these tests.

The first series of six swabs was taken on March 12 from the two Bibles (one for white and one for colored) used in the city court, and cultured on Loeffler's media. Smears from one of these showed a practically pure culture of B. diphtheriæ and a second from another part of the same Bible (the one used by whites) showed B. diphtheriæ in mixed culture. The second series taken from these same Bibles on March 26 on Loeffler's media and on blood agar showed but one smear positive for diphtheria out of eight swabs taken. This one was again practically pure culture and from the same Bible as in the previous series.

In the county court in order to expedite the swearing of witnesses there are provided a larger number of Bibles. Four of these were selected and marked for culturing. In the first series of six swabs taken in this court on March 14 the cultures were made on Loeffler's media. Two of these cultures, both taken from Bible "A" showed B. diphtheriæ in pure culture. On March 26 the superior court was sitting in the county court room and on this date three additional Bibles were selected, marked and cultured with three of those cultured previously all of these being cultured on Loeffler's media and on blood agar. Bible "A" which showed positive before showed no diphtheria this time, either on blood agar or on Loeffler's media and but one of the twelve cultures from the six Bibles showed B. diphtheriæ and that in mixed culture on serum media from Bible "D."

In these four series of swabs, thirty-two cultures were made from nine Bibles. Six cultures and three Bibles showed diphtheria. Of these three Bibles, the Bibles for whites in the city court showed it in two cultures taken two weeks apart. Bible "A" showed it in the first culture but did not in the second culture twelve days later. Bible "D" did not show it upon first culturing but did twelve days later.

The diphtheria organisms found were principally those of Westbrook's types c, d, cl and dl; though c2 and d2 were found also. Most workers agree that the first two types are virulent and opinion on the others is divided, however virulence tests of the organisms of these classes isolated from the Bible covers were all negative.

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REPORT OF THE COMMITTEE ON STANDARD METHOD FOR THE PREPARATION OF TUBERCULIN.

Presented before the Laboratory Section, American Public Health Association, October, 1917, at Washington, D. C.

A LIST of questions covering all details of the preparation of old tuberculin has been sent to all laboratories making old tuberculin. For the past two years experiments have been made with a view to simplifying its preparation and while the results are not yet ready for publication it can be announced that a standard method will soon be recommended.

Owing to the fact that there are no standard methods for determining the potency of old tuberculin, it is strongly recommended that hereafter all lots be tested by the following tentative plan. Immediately before releasing the tuberculin for distribution suitable dilutions shall be made in sterile salt solution so that 0.1 cc. shall represent 0.00001, 0.000001, 0.0000001 and 0.00000001 cc. tuberculin respectively, and then 0.1 cc. of each solution shall be injected intradermally by the Mantoux method on the inner surface of the forearm of a known tuberculin sensitive individual.

A standard tuberculin will be supplied by the committee for determining a proper test subject. No tuberculin which fails to give a characteristic and positive reaction in a quantity one decimal point less than the standard tuberculin shall be released for distribution.

(Signed) BENJAMIN WHITE.

THEORY *vs.* PRACTICE IN VITAL STATISTICS.

A REPLY TO PROF. W. F. WILLCOX.

T. D. Tuttle, M. D.,
State Commissioner of Health, Seattle, Washington.

Read before Public Health Administration Section, October 18, 1917, at Washington, D. C.

IN THE June issue of this Journal, Professor W. F. Willcox publishes a reply to a paper read by me before the American Public Health Association at Cincinnati, October 27, 1916, and published in this Journal in the issue of April, 1917. As Professor Willcox advances certain theoretical arguments in contradiction to my findings, I feel that I am justified in offering the readers of this Journal a reply to Professor Willcox's criticism.

On page 562, column 2, Professor Willcox states: ". . . the hearing transferred to a jury composed mainly of physicians, few of whom probably have been trained in vital statistics." It is evident that Professor Willcox is not aware of the fact that a fairly large per cent of the membership of the American Public Health Association are not physicians and that its membership includes a large number of men whom most of us would designate as "statists." But the question that I mainly challenge is the statement that the physicians who are members of the American Public Health Association have had no training in vital statistics. I hold that these physicians have had the very best possible training, because their training is of a character that takes them into the field. They know the actual difficulties encountered in collecting death records. Their work is not theoretical, it is practical, and they know absolutely whether or not they are getting the death returns because they are there and can see. Dr. Cressy Wilbur is a "physician," but some of us, at least, had a very high respect for him as a statistician.

In 1916 Doctor Wilbur was sent to Washington by the Federal Census Bureau to investigate the enforcement of the registration act in Washington. Doctor Wilbur's report has not been published, so far as I know. I regret that Professor Willcox has not had an opportunity of reading this report. Doctor Wilbur made a thorough investigation of the workings of the registration act in Washington, and I am of the opinion that it was as a result of Doctor Wilbur's report that Professor Willcox's suggestion of 1915, based purely and simply on theoretical findings, was not carried out by the Census Bureau.

On page 563, column 1, Professor Willcox asks: "Let me ask first, How small a death-rate will be accepted by experts without suspicion that it is inaccurate?" I do not know how small a death-rate would be accepted by the theoretical statist, but I do know how small a death-rate would be accepted by the practical field man; namely, that death-rate which resulted from a known complete death return, this knowledge being based on actual investigation by a trained collector of vital statistics. This and this only is the proper foundation for determining a death-rate in any locality. It may not meet text-book ideas but it results in cold-blooded facts.

On page 564, Professor Willcox selects the year 1910 as a basis of population without flaw, because the census was taken in 1910; and yet, on page 568, he states very positively that the census of the State of Washington was very badly padded. How does he make these two statements conform with the idea of securing an absolutely correct death-rate per thousand population?

I acknowledge his criticism in the latter sentence of Par. 1, column 2, page 565, but as I stated in my argument, I eliminated both deaths and populations of unknown ages, as I was not conducting a guess work study. Such guess work must be conducted by the theoretical statist and not by a field man.

On page 568, column 2, Professor Willcox states: "But errors in an enumeration are far easier to detect than errors in the registration of deaths. . . ." Theoretically this may be true, practically it is not. Returns in collecting deaths can be absolutely checked. With 425 registration districts in the State of Washington, covering the entire populated portion of the State, we can check to a fairly accurate degree whether or not the records of all deaths are being secured. It is certainly a more simple matter to count the dead ones than it is to count the living ones, for even in England there are more live ones than there are dead ones. I mention England because Professor Willcox mentions England only as a basis of death returns. He seems to have forgotten that there are other countries in which conditions more accurately correspond to those in Washington.

With regard to inaccuracies of the United States Census Bureau's method of estimating population, Professor Willcox and I heartily agree, as shown by the following quotation, column 1, page 569: "Any method which assumes that the population grows regularly is bound to be a misfit when applied to a population which grows irregularly, as it does in the far western states, and many estimates of population, therefore, especially for the latter years of a decade, are bound to be wide of the mark." I agree with Professor Willcox in this statement, and would add also that they may be wide of the mark in the earlier years of the decade, especially when such unusual conditions arise as did in the extreme northwestern states and British Columbia from the early part of 1909 to the end of 1912.

Whether the method suggested by me would furnish a more practical method of estimating populations, can be determined only by actual experience and not by theoretical argument. The fact that an unusual outbreak of disease would apparently upset this does not contradict my theory, because I plainly state in my article, which Professor Willcox fails to mention in his quotations, that an unusual outbreak of disease would necessitate a close coöperation between the field man (the health officer) and the office statistician. Such coöperation would correct any error arising from an unusual outbreak of disease.

The whole question revolves itself into the old saying "The proof of the pudding is in the eating." In my study I took into consideration six states. I said that the population in Washington and Oregon was overestimated. The registration of men for the United States Army clearly demonstrated this to be a fact. I stated that the population in Indiana and Michigan were underestimated. The returns of the army registration demonstrated this to be a fact. I stated that the estimated population of Connecticut was very accurate. Note the confirmation of this statement by the registration returns. Finally, I stated that the population of Massachusetts was probably overestimated. The returns would contradict my findings in Massachusetts. In other words, my "guess" met the conditions in five out of six instances. Incidentally, in regard to Massachusetts, I stated that it was possible that the public health work in Massachusetts had resulted in a greater reduction in deaths in that state than might be apparent; that is, that the public health work influenced the death-rate in non-preventable diseases more than I had given credit in my studies.

I do not for an instant pose as an "expert statist." I am just a mere doctor, but having devoted a little more than fifteen years in collecting the data on which the "expert statist" bases his conclusions and from which he spins his more or less delicate theories, I feel that I am justified in saying that, in my very humble opinion, Professor Willcox has based his conclusions on some erroneous assumptions. First, he assumes that his conclusions have been challenged. I plead guilty to ignorance, more and more every year, but the fact is I never heard of Professor Willcox or his conclusions until the day I read my paper at Cincinnati last fall, when a friend of mine asked me if my paper was a reply to the statements made by Professor Willcox. In the second place, Professor Willcox in his arguments uses a stationary population as a basis of argument. There is no stationary population in Washington, hence, any argument that applies to a locality where there is a stationary population cannot apply to the State of Washington. Finally, Professor Willcox flatly charges that the death returns in Washington are incomplete and that a death-rate of 10 per thousand for the State of Washington is absurd. Instead of making an actual investigation with regard to the death returns in the State of Washington, upon which the death-rate is based, he attempts to prove his assertion by technical arguments—so technical as to suggest reference to authorities on mortality tables, such as Professor Glover, Dr. Frederick L. Hoffman, etc. At my suggestion Doctor Hoffman was good enough to read my original article long before the same was considered suitable for presentation before the American Public Health Association, and subsequently thereto he has, not only on his own part reviewed the arguments brought forward by Professor Willcox, but he has had the same subjected to critical consideration by Mr. Knud Stoumann, one of his statistical assistants with experience in Danish and English statistical offices. I, therefore, give Mr. Stoumann's conclusions concerning these questions rather than my own, but, of course, in a much abbreviated form on account of the limitations of time.

According to Mr. Stoumann: "The main argument of Professor Willcox is that the death-rates of the State of Washington when applied to a 'stationary' population give an abnormally low death-rate and an apparently absurd average duration of life of 70.3 years. This expectation of life is arrived at by applying the Washington state death-rates by sex and age to the 'stationary' population corresponding to the life table of 1909–1911 for the original registration states and computations by Professor Glover of the University of Michigan. By dividing this standard death-rate into one thousand Professor Willcox obtains an apparent average duration of life which in text-books is commonly designated as the expectation of life at birth.

"The true expectation of life at birth, as, of course, is well known, can be obtained by dividing one thousand by the death-rate per thousand standardized for age and sex constitution on the basis of the 'stationary' population derived from the same population and mortality sources. It is extremely dangerous in statistical practice to utilize a 'stationary' population for one area or country as a test as to the accuracy of the mortality returns for another area or section, for reasons which do not seem to require extended explanation. A stationary population is a population where the number of deaths equals the number of births, which, of course, in actual practice never precisely occurs anywhere, although an approximate stationary condition of the population may be reached, as for illustration in France, and apparently among our American Indians. Such a stationary condition is possible whether a mortality rate is high or low and without regard to the portion of life which may be subject to the most severe strain or stress of mortality as conditioned by lack of disease resistance. A number of stationary populations varying in degree and kind are thus possible, and since the standard death-rate depends upon the standard selected the expectation of life at birth would thus vary according to the particular stationary population used. Since it is readily conceded that population and mortality conditions in Washington vary quite considerably in nature and degree from those of the old registration states which form the basis of the Glover life tables, it is self-evident that such a stationary population as is therein used should not have been used by Professor Willcox in ascertaining the theoretical accuracy or inaccuracy of the Washington mortality returns.

"Unfortunately the true expectation of life can be computed only by the slow and laborious but mathematically correct actuarial methods. The application of such methods is extremely difficult in the present case since all life tables assume a normal population flow or a fairly stationary condition of the population as to settlement, migration, immigration, etc., which, of course, is not the case with the State of Washington where conditions as yet are far from having reached maturity. If, however, the method used by Professor Willcox in computing the expectation of life at birth is applied, for illustration, to Australia, it appears that the expectation thus determined is 70.4 years, although the life tables for the commonwealth computed by thoroughly trustworthy mathematical methods give the true value at about 57 years, or about 13 years less.

"On this fallacious assumption, therefore, the main attack against the Washington data is made by Professor Willcox and the plea is advanced that the state should be excluded from the registration area. Such action would indeed be a wrongful procedure in view of the splendid effort which has been made by the Washington and Oregon health officials to secure complete registration of deaths even in the most remote and sparsely settled counties of their states. In order to make the point involved entirely clear a life table has been constructed for the State of Washington by Mr. George King's well known and recognized method of constructing an abridged life table, which gives entirely trustworthy values from the age of 12 to well-advanced years, for at extreme ages the numbers are almost invariably too small for safe conjecture and trustworthy methods of random sampling. An attempt has not been made to determine the values for the early years of life, since these are invariably uncertain, even when the returns are absolutely complete, on account of the effect of wide variations in infant mortality, immigration, population composition, etc. For the present purpose the three years, 1909–1911 have been used, since these are the years employed in the Glover life tables, based on the United States Census. The results of these computations for specimen ages, according to sex, are hereto attached in Tables I and II. The value of life tables for a variety of purposes is easily exaggerated. The expectation of life or the average duration of life is a function frequently without real importance and often seriously misleading. Particularly uncertain is the expectation of life at birth, and since Professor Willcox limits most of his considerations to this value, which is strongly influenced by the high mortality during the first years of life, his conclusions are further impaired in scientific value. The expectation at birth requires to be used with the same extreme caution for general purposes as the crude mortality rates covering all ages and a wide range in sex, race, nativity, occupation distribution, etc.; only observation of the peculiar local changes of the mortality curve by age, and a minute scrutiny of its constituent parts will justify at least approximately trustworthy final conclusions.

"The expectation of life is somewhat more satisfactory or trustworthy when the uncertain age of infancy has been passed or been eliminated. In Table III, therefore, the expectation

TABLE I.

PROBABILITY OF DYING INSIDE OF ONE YEAR IN THE STATE OF WASHINGTON; BASED ON ESTIMATED POPULATION DISTRIBUTED ACCORDING TO THE CENSUS OF 1910, AND THE REPORTED DEATHS 1909, 1910 AND 1911.

	Male				Female			
Age	Graduated population	Graduated deaths	Mx	Qx	Graduated population	Graduated deaths	Mx	Qx
12	28,287	71	.00251	.00251	27,700	69	.00249	.00249
17	31,202	129	.00413	.00412	28,900	102	.00353	.00352
22	44,408	216	.00486	.00485	30,116	147	.00488	.00487
27	47,701	235	.00493	.00492	29,378	151	.00514	.00513
32	39,862	226	.00567	.00565	25,004	141	.00564	.00562
37	33,016	226	.00685	.00683	21,593	128	.00593	.00591
42	28,848	231	.00801	.00798	18,047	116	.00643	.00641
47	24,348	244	.01002	.00997	15,110	121	.00801	.00798
52	20,179	260	.01288	.01280	11,784	124	.01052	.01046
57	12,591	236	.01874	.01857	7,609	119	.01564	.01552
62	9,891	235	.02376	.02348	5,705	117	.02051	.02030
67	5,801	211	.03637	.03572	4,245	137	.03227	.03176
72	3,593	210	.05845	.05679	2,658	129	.04853	.04738
77	2,014	175	.08689	.08327	1,543	123	.07971	.07665
82	842	118	.14014	.13096	661	78	.11800	.11143
87	277	53	.19134	.17463	247	40	.16194	.14981
92	59	13	.22034	.19847	57	14	.24561	.21875

NOTE. Mx is the central death-rate, when multiplied by 1,000 it gives what is commonly called the mean annual death-rate per 1,000.

Qx is the probability of dying in a certain year of life.

of life of males in the State of Washington from ages 12 and upward is compared with that of other known healthy countries or states, such as Michigan, Indiana, Australia, Denmark, Norway and rural England. The table brings out the exceedingly interesting fact that the differences between these seven countries or states are relatively slight. It will be observed that the expectation of life for females, ages 12 to 22 in the rural districts of England and in Norway at ages 32 to 72 is even higher than for the State of Washington, but no charge of material inaccuracy is likely to be brought against the registration returns of the two countries referred to. On account of the want of trustworthy statistics of births the functions for the first years of life have not been computed, these being of minor importance; but from the death-rate alone it is possible to roughly estimate the expectation of life at birth, which for males is 56 years and not 70.3 as claimed by Professor Willcox for both sexes combined. This expectation is exceeded not only by the white females of the original registration states, whose expectation of life at birth is 57.35 years, and which Professor Willcox claims to be the highest on record, but also by the females in Norway, 57.70; by Denmark, 57.90; by Sweden, 57.0; by Australia, 58.84; by Tas-

TABLE II.

LIFE TABLE FOR MALES IN THE STATE OF WASHINGTON; BASED ON THE CENSUS OF 1910 AND THE REPORTED DEATHS, 1909, 1910 AND 1911.

Age	qx	log. px	log. 5px	1x	N^1x_5	N^1x	Ex
12	.00251	−.00109	−.00672	100,000	495,753	5,277,930	53.28
17	.00412	−.00179	−.00972	98,465	485,943	4,782,177	49.07
22	.00485	−.00211	−.01062	96,285	474,488	4,296,234	45.12
27	.00492	−.00214	−.01118	93,959	462,722	3,821,746	41.17
32	.00565	−.00246	−.01338	91,571	449,679	3,359,024	37.18
37	.00683	−.00298	−.01583	88,793	434,708	2,909,345	33.27
42	.00798	−.00348	−.01899	85,615	417,328	2,474,637	29.40
47	.00997	−.00435	−.02389	81,952	397,000	2,057,309	25.60
52	.01280	−.00559	−.03287	77,566	371,391	1,660,309	21.91
57	.01857	−.00814	−.04448	71,912	339,130	1,288,916	18.42
62	.02348	−.01032	−.06108	64,911	299,861	949,788	15.13
67	.03572	−.01580	−.09681	56,395	249,091	649,927	12.02
72	.05679	−.02539	−.14937	45,126	186,636	400,836	9.32
77	.08327	−.03776	−.23320	31,995	119,541	214,200	7.20
82	.13096	−.06096	−.35167	18,701	60,767	94,659	5.56
87	.17463	−.08335	−.44047	8,321	24,039	33,892	4.57
92	.19847	−.09608	−.51614	3,018	7,893	9,853	3.76
97	.25385	−.12717	−.84762	920	1,839	1,960	2.63
102	.46560	−.27213	−2.04746	131	120	121	1.42
107	....	....	....	1	1	1	....

NOTE. qx is the probability of dying in a year, px the probability of living a year, and 5px the probability of living five years.

1x is the number surviving to exact age x. N^1x_5 is the sum of five values of 1 from x+1 to x+5; N^1x is the sum of the column of 1x from age x+1 to the oldest age. Ex is given in years, and is the complete expectation of life, the average future lifetime of persons aged exactly x.

TABLE III.

EXPECTATION OF LIFE FOR MALES IN THE STATE OF WASHINGTON COMPARED TO OTHER STATES AND FOREIGN COUNTRIES.

Age	Washington 1909–11	Michigan 1909–11	Indiana 1909–11	Australia 1901–10	Denmark 1906–10	Norway 1901–10	England Rural Districts 1911–12
12	53.28	52.34	52.38	51.72	53.2	51.24	54.16
17	49.07	48.01	48.10	47.28	48.8	47.12	49.68
22	45.12	44.03	44.25	43.07	44.6	43.99	45.37
27	41.17	40.14	40.53	38.96	40.5	40.90	41.15
32	37.16	36.16	36.79	34.90	36.4	37.43	36.97
37	33.27	32.19	32.97	30.90	32.2	33.74	32.82
42	29.40	28.20	29.11	27.03	28.2	29.97	28.72
47	25.60	24.34	25.22	23.32	24.4	26.19	24.73
52	21.91	20.61	21.43	19.75	20.7	22.48	20.86
57	18.42	17.01	17.78	16.31	17.2	18.90	17.19
62	15.13	13.71	14.34	13.09	13.9	15.43	13.82
67	12.02	10.77	11.23	10.19	10.9	12.28	10.76
72	9.32	8.20	8.58	7.77	8.3	9.48	8.13
77	7.20	6.12	6.39	5.89	6.1	7.07	6.03
82	5.56	4.53	4.66	4.40	4.3	5.13	4.43
87	4.57	3.48	3.56	3.22	3.0	3.72	3.23
92	3.76	2.66	2.62	2.31	....	2.71	2.39
97	2.63	2.06	1.74	1.63	....	1.98	1.92

TABLE IV.

PROBABILITY OF DYING IN A YEAR FOR MALES IN THE STATE OF WASHINGTON COMPARED TO OTHER STATES AND FOREIGN COUNTRIES.

Age	Washington 1909–11	Michigan 1909–11	Indiana 1909–11	Australia 1901–10	Denmark 1906–10	Norway 1901–10	England rural dists. 1911–12	M. A. (x) 1885–1912
12	2.51	2.38	2.32	1.84	1.77	2.84	1.60	....
17	4.13	3.47	3.80	3.03	3.03	6.33	2.56	....
22	4.86	5.40	5.76	4.04	4.20	9.38	3.43	4.6
27	4.93	5.22	5.44	4.78	4.15	8.21	3.90	4.8
32	5.67	5.63	6.30	5.58	4.78	7.35	4.56	4.9
37	6.85	6.51	6.88	6.98	5.77	7.47	5.34	5.3
42	8.01	7.37	8.09	9.10	7.84	8.12	6.85	6.2
47	10.02	10.50	10.29	12.04	10.15	9.64	8.74	8.5
52	12.88	12.80	11.81	15.38	13.57	12.29	12.01	12.5
57	18.74	18.74	19.41	20.71	19.78	15.71	17.59	18.5
62	23.76	28.00	26.28	30.12	27.46	22.40	26.71	29.1
67	36.37	42.31	40.59	46.44	40.44	33.85	40.18	47.1
72	58.45	65.89	63.41	74.15	62.37	50.71	66.15	72.3
77	86.89	102.41	104.37	111.58	99.60	80.48	103.76	107.9

(x) Life Table of the Medico-Actuarial Committee; in the above table the first four policy years are excluded, that is, the years where medical selection is felt the strongest.

NOTE. The above table gives 1,000qx or rates per 1,000, these being more easily compared than the small values of qx.

TABLE V.

PROBABILITY OF DYING IN A YEAR FOR FEMALES IN THE STATE OF WASHINGTON COMPARED TO OTHER STATES AND FOREIGN COUNTRIES.

Age	Washington 1909–11	Michigan 1909–11	Indiana 1909–11	Australia 1901–10	Denmark 1906–10	Norway 1901–10	England rural districts 1911–12
12	2.49	2.05	2.19	1.75	2.21	3.53	1.73
17	3.52	3.40	4.05	2.69	3.36	5.35	2.69
22	4.87	5.41	5.93	3.70	4.00	6.44	3.29
27	5.13	5.45	6.34	4.69	4.69	6.75	3.74
32	5.62	5.95	6.67	5.58	5.10	7.14	4.45
37	5.91	6.89	7.03	6.59	5.70	7.53	5.11
42	6.41	6.99	7.76	7.57	6.69	7.88	5.87
47	7.98	9.20	9.16	8.51	7.73	8.42	7.31
52	10.46	12.06	12.20	10.54	10.23	10.32	10.37
57	15.52	16.86	16.58	14.76	13.45	13.33	15.33
62	20.30	24.16	24.63	22.97	21.02	18.78	22.01
67	31.76	36.97	37.80	35.77	34.32	28.57	33.40
72	47.38	61.50	62.84	58.87	54.83	44.88	56.58
77	76.65	94.10	91.93	91.01	89.67	73.69	89.54

mania, 59.29; by New Zealand, 61.76; also by the males separately in Tasmania, 57.76; and by New Zealand males, 59.17.

"A more useful comparison is made in Tables IV and V, showing the probability of dying in a year. These tables indicate that the mortality curve for the State of Washington is by no means the lowest on record and show a pronounced similarity to the male and female mortality curves for the States of Michigan and Indiana. The rates are even lower for the males of Denmark, ages 12 to 42, and for the females of Denmark, ages 12 to 37, for the males of Norway, ages 52 and upward, and the females of Norway, ages 47 and upward, and finally for the rural districts of England for males as well as females, ages 12 to 57 inclusive.

"These general observations would therefore seem to justify the conclusion that in their general aspects the mortality data for the State of Washington do not justify the charge of obviously incomplete registration and that the mortality rates are in all probability as trustworthy as those for other registration states when the local facts of population distribution, with all that that implies as to age, race, nativity, occupation, etc., are taken into account. Furthermore, it is entirely safe to assert that there is a definite and measurable relation between what is generally called the local climate or weather conditions, etc., and the actual health and longevity of the inhabitants, and there can be no question of doubt but that these conditions in the State of Washington are more advantageous than in many other sections of the United States and abroad. It requires also to be kept in mind that in a new state the heavy immigration consisting chiefly of healthy and strong individuals from other sections has an effect somewhat similar to medical selection in life insurance. Just as cripples, weaklings or consumptives do not emigrate to new lands to do pioneer work or engage in lumbering, mining, etc., so the rejection rate in life insurance eliminates those predisposed to early death from the risks accepted and insured at normal rates. All the investigations which have been made into the influence of medical selection on life insurance experience prove that the mortality rate is quite considerably reduced, at least during the first five years of insurance. According to the Medico-Actuarial Investigation the mortality rates per thousand during the first policy year when compared with the fifth or later years of duration at specimen ages have been as follows:

Ages	First policy year	Fifth or later policy year	Ratio 1st to 5th or later year
22	3.3	4.6	72
32	3.7	4.9	76
42	4.7	6.2	76
55	12.2	15.8	77

At age 32, for illustration, the death-rate was 3.7 per thousand during the first year of insurance against 4.9 per thousand during the fifth or subsequent years; in other words, the rate during the first year was only 76 per cent of the rate during the later years. The same conclusion applies to the mortality rate of a new area or state where the conditions of life have not attained to maturity or where they are not as yet thoroughly representative of the conditions common to normal and long-settled populations."

I regret that I am not personally acquainted with Professor Willcox, but I presume he is really earnest in his statements and is willing to make some sacrifice to prove them correct, which he undoubtedly feels he is able to do. Therefore, I have the honor to submit the following propositions:

1st. If Professor Willcox will come to Washington and make an actual study of conditions and will show that we are not getting more than 95 per cent of the deaths that occur in this state, I will pay all expenses incurred by him in such work.

2d. If it were not inappropriate to make such a suggestion I would be entirely willing to pay a penalty of $5 for every death in excess of 50 ascertained to have been unrecorded during the previous calendar year by Professor Willcox or any one delegated by him for the purpose, the money to go to the National Red Cross.

DISCUSSION.

Mr. Knud Stoumann: "Theory *versus* Practice in Vital Statistics" is a case it should be unnecessary to bring to judgment and that can arise only through mistakes or lack of mutual understanding, and the title of this paper may, therefore, not be quite appropriate. If the word "and" had been substituted for "versus" the problem would have suggested for discussion a subject that, although fundamental, has received scant attention from the workers of statistics.

Theory and practice should go hand in hand; they are, in fact, only different perspectives of the same subject. If a discrepancy should appear between the two, one of them, at least, must be at fault. If the practical gatherer of statistical data disregards the rules laid down in the theory of statistics his data are apt to become worthless and his conclusions will be void. If, on the other hand, the student of statistical theory arrives at conclusions that are at variance with the facts, his hypotheses have been erroneous or his reasoning has been illogical.

The late Professor T. N. Thiele, the eminent Danish authority on life tables and the theory of probabilities, and at the same time an astronomer of high merit and a practical actuary, says very appropriately in his book "Theory of Observations":

> "It will be found that every applied science, which is well developed, may be divided into two parts, a theoretical (speculative or mathematical) part and an empirical (observational) one. Both are absolutely necessary and the growth of science depends very much on their influencing one another and advancing simultaneously. No lasting divergence or subordination of one to the other can be allowed."

If you health officers and registrars of vital statistics find that your orbservations, duly certified to be correct and complete, do not conform to our theory, it is your privilege to reject, if necessary, the hypotheses of the theory, and demand the theorist to revise his work. Years ago an old farmer in the parliament of Denmark when pressed hard by adverse facts piled up against him routed his opponents by exclaiming: "But I deny facts!" This may be final in politics but hardly permissible in science.

This has a direct bearing upon the question that brought Doctor Tuttle here from Seattle. The completeness of the death registration in the State of Washington for which he is responsible has been attacked from a theoretical standpoint, and he is here to defend his honor as health administrator. I understand that actual investigation conducted by the Federal Census Office has proved the registration of deaths in the State of Washington to be as complete as in the Eastern States. We can, therefore, without further discussion reject the hypotheses on which the attack was based. But a hard feeling may remain, and the incidence constitutes a warning to the students of theory to be more careful in the selection of their hypotheses and to pass judgment only after the most thorough analysis.

A perusal of the article in question shows the main hypothesis, in abridged form, to be that: "Under present American conditions and in a normally constituted but increasing population a death-rate of below 14 may be viewed with serious question; a death-rate of below 12 is presumably incorrect, and a death-rate of below 10 deserves no serious statistical analysis.''

No proof or justification is given of this statement and we may, accordingly, consider it a hypothesis. As such it is a failure, if only because its application is restricted to American conditions; the statement is known to be at variance with the conditions in Denmark, Norway, Sweden, Holland, Australia, New Zealand and several minor localities, and consequently it cannot be accepted without further comment as valid for America. Hypotheses should always be of a general character and limited in number.

Furthermore, no crude death-rate should be employed to decide important issues as it is a too composite figure, influenced by every peculiarity of the population composition as race, sex, age, occupation, etc. When analyzing statistical data all influences but the one to be compared for should first be eliminated; if this is impossible we can draw no safe conclusions, and the only honorable course is to admit that. Standardization of death-rates for sex and age constitution is very simple and is no new invention; it was practiced as early as 1853 in the British Army Statistical Report. But in a thorough analysis we cannot consider this sufficient; the compound death-rate for all ages will, even when standardized obscure the peculiarities of the mortality curve at the different periods of life. We are entitled to regard our work as finished only when the life tables for each sex and race, or the specific death-rates for sufficiently short period of life, are computed, and when the causes of death and the regional and occupational influences are minutely exposed. Our minds should be blank when we commence the statistical analysis, and sensationalism must be shunned; hasty conclusions are a thousand times worse than none. The famous Belgian statistician and astronomer Quetelet wrote about 1837: "In fact many persons only recur to statistics with a view to give consistency to preconceived ideas: they wrap up their ideas in a scientific veil in the hope of rendering them imposing."

The registrars of statistics and the builders of the theory should be equally true to the science they persue, and know that they are equally indispensable. The possibilities of statistics as a helper to all other sciences are only beginning to be realized, and posterity will count you among the most useful servants and promoters of mankind.

Remember that every faulty or hasty statement is a step backward and injures the entire profession, and always bear in mind that theory and practice can do their duty only by working in close harmony.

◆

A COMMUNICATION FROM PROFESSOR WILLCOX.

The foregoing paper needs no extended reply. Whoever is interested in the issues about which Doctor Tuttle and I differ has accessible in this article and its predecessors the material for forming his own opinion about them. It may be worth while, however, briefly to recount my previous experiences in this field and to restate my main points.

Years ago, when the death-rate of Ithaca seemed incredibly low, I found on investigation that nearly one third of the deaths went unregistered in disregard of the law, but it took many months with the help of several students to establish the facts. Some years later I challenged the death-rate of Buffalo, which then claimed to be the healthiest city in the world, because it had the lowest death-rate. I obtained opinions from Mr. Hoffman, who was disposed to accept the Buffalo figures, and from Doctor Billings, who rejected them. Evidence from the census of 1900 proved, some years later, that my contention about that city had been correct. A third challenge of the same sort was made about the infant mortality of England and Wales.* This elicited no reply from the author whom I criticized, but brought from the first English authority in vital statistics a private letter accepting my conclusions. With these confirmations and no refutations of similar opinions expressed in the past, I am content in this case to await the verdict of the judicious.

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* *The Nation*, Vol. lxxxv, p. 227 (September 12, 1907).

My main points briefly are these:

1. To develop a system of recording deaths with substantial completeness requires not merely a good registration law, but also years of energetic and tactful administration.

2. The obstacles to the development of such a system in newly settled states and in sparsely settled districts are especially great.

3. The published death-rates of several American states and of many rural counties are so low as to warrant their rejection as untrustworthy.

4. When the correctness of these rates is tested by studying their local variations of the infant mortality or the ratio of deaths from preventable disease to all deaths or the conclusion from applying the rates to any standard population, the results are such as to strengthen rather than weaken one's disbelief in them.

5. These general conclusions apply to the state of Washington and especially to its rural counties with greater force than to any other state and justify a skeptical attitude towards its published death-rates.

6. It is the duty of a statist to form an opinion about the probable error of any figures he uses and to lay that opinion, with the reasons for it, before his readers.

Walter F. Willcox.

BLEACHING POWDER IN PLACE OF PERMANGANATE IN FUMIGATION.

David Wilbur Horn, Ph. D.,

Abstracted from a paper read before Section C, American Association Advancement of Science, Dec. 28, 1917.

THE action of bleaching powder upon formalin is a good and cheap way to fumigate rooms. Since originated by the writer in 1915 it has been used without any objection in fumigating upward of 2,200 rooms.

The various methods heretofore used are not equally efficient. The permanganate-formalin method in the ratio of 1 part by weight of permanganate to 2 parts by volume of formalin yields as gas about 37.5 per cent of the total weight of formaldehyde actually dissolved in the formalin used; and 250 grams of permanganate with 500 cc. of formalin yield about 75 grams of formaldehyde gas; these are the amounts usually recommended for 1,000 cubic feet.

In order to get this same weight of formaldehyde gas (*i. e.*, 75 grams) about three times as much of sodium dichromate, sulphuric acid, glycerine and formalin, as recommended for 1,000 cubic feet by the Pennsylvania Department of Health, must be used.

In order to get this same weight of formaldehyde gas, (*i. e.*, 75 grams) one should use for 1,000 cubic feet the following:

Bleaching powder, 620 grams, or one and one-third pounds.

Formalin, 800 cc., or one and seven-tenths pints.

At current prices (December 24, 1917) the costs of fumigating 1,000 cubic feet by the three methods are:

Permanganate-formalin, $2.29.
Dichromate-formalin, 1.14.
Bleach-formalin, .39.

The statements of Hamilton in a paper from the Research Department of Parke Davis & Company in the March number of this Journal, page 283, under the title "Facts and Fallacies in Disinfection," are utterly misleading if applied to fumigations using bleach and formalin. Hamilton himself was misled by his fallacious assumption that Frankforter & West's method for determining evolved formaldehyde was applicable to the assay of fumigation-mixtures.

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A NATIONAL PUBLIC HEALTH DEPARTMENT IN ENGLAND.

To readers of the JOURNAL no recent occurrence has created more interest than the report that a petition had arisen within the United States Public Health Service, which has grown out of the Marine Hospital Service, almost as old as the Union itself, to have the Service absorbed either into the national army or into the navy of the United States. A later report has it that the amalgamation would probably not be completed. While an intense patriotism is implied when so well equipped a civil organization should wish to be placed where its splendid personnel could engage in the more active and congenial labors of a fighting arm of the service; yet that this action becomes of especial moment, viewed from the standpoint of those who have been looking for great developments of the internal public health services of the country and continent, need not be questioned.

The action thus taken is of further interest in view of the growing agitation in England where, with the two traditional services of the army and navy just now of such supreme importance, medical men and those associated in sanitary and social work are demanding that in the interests of efficiency, economy and scientific development, the government should establish at once a Ministry of Health under which would be coördinated much public health work at present being carried on by different departments of the Public Service. Press reports from England seem somewhat contradictory, as where the Daily *Express* of London recently published a long article to the effect that Dr. Addison, Minister of Reconstruction, had been offered and accepted the post of Minister of Public Health. This statement, however, was refuted by an official announcement "that his only personal concern with the question of the establishment of the Ministry of Health has been that as Minister of Reconstruction he is giving assistance in arriving at an agreed scheme for the establishment of a Ministry."

How rapidly the evolution of medical and public sentiment in this direction has gone in England since the Health Insurance Act of 1911, then so bitterly opposed, had proved of such great benefit not only to the public but to the medical profession is seen in the following résumé of the report of a Committee of the British Medical Association:

"The degree of unanimity so far disclosed is somewhat remarkable and suggests that the scheme which is proving a distinct gain to the medical profession as well as to the public be still further extended to the dependents of insured persons, and for providing, when necessary, specialists and nursing services, institutional treatment, maternity attendance etc., beyond what can be provided by the general medical practitioner."

To illustrate further the sentiment of those professionally engaged in public health work the following summary of a petition forwarded to the Local Government Board by the officers of the two chief Public Health Societies in England representing 1,100 medical officers may be given:

A MEMORANDUM RE MINISTRY OF HEALTH.

Your memorialists submit that:

1. The present wasteful and inefficient system by which the responsibility for the nation's health is divided up centrally among so many departments is to be deplored.

2. That the unification and control of all machinery for such work, both central and local, which is for the maintenance of health and the provision of treatment for the people is essential.

3. That the establishment of a Ministry of Health with a Central Health Department is essential to this end and that it should include provision for and control of,

(a) Sanatoria and treatment of tuberculosis.
(b) Provision of isolation hospitals and control of contagious diseases.
(c) Prevention and cure of venereal diseases.
(d) Administration of the Vaccination Acts.
(e) School hygiene and inspection of children.
(f) Supervision of state provided medical services and state-supported institutions.
(g) Maternity and child welfare work.
(h) Medical research and provision of laboratories.
(i) Control of public water supplies, gathering grounds, etc.
(j) Housing and town planning.
(k) Sewerage, drainage and abatement of nuisances, etc.
(l) Ship sanitation and hygiene.
(m) Sanitary control of emigrants and immigrants.
(n) Railway hygiene.
(o) Milk supply and food inspection.
(p) Factory and workshop inspection, hours of work, factory welfare work.
(q) Compilation of vital statistics.
(r) Public health legislation.

P. H. B.

A WELCOME TO WOMEN IN PUBLIC HEALTH WORK.

With the call to the colors of medical men, sanitarians, and health officers, great gaps have been made in the ranks of defenders of the health of the civilian population. This is even more notable in public health circles than elsewhere because, public health science being comparatively young, its practitioners are largely within the draft age.

The suggestion naturally arises: why should not young women already trained or available for training be used to fill many of these positions? The supply of women physicians really qualified to undertake public health work is probably small, but some of those recently graduated ought to be fairly well prepared and others might soon prepare themselves by short courses in one of the several schools now available for those lacking public health training. Moreover, there must be in the medical schools a good many young women who, without stopping at present to finish their courses for the degree of Doctor of Medicine, might interrupt their medical training to take that brief but indispensable technical training, which would fit them for public health positions.

Recently, the Chairman of the Harvard-Technology School for Health Officers, discovering from his own observation and from the applications which he has been receiving and unable to fill for health officers, laboratorians, industrial health inspectors, municipal filter operators and the like, the great scarcity of trained public health workers, has visited the larger women's colleges in Massachusetts, making addresses on the need and opportunity for women in all sorts of technical pursuits, and appealing particularly to those seniors having medical or semi-medical tastes to prepare themselves in chemistry, physics, and biology as thoroughly as possible before graduating in June next, and then to take during the summer intensive work in public health subjects which will fit them for professional positions in laboratories, inspectorships, and the like, possibly by the first of next October.

This movement is not confined to the East, for Prof. W. H. Frost, of the University of Wisconsin states that a considerable number of his women students in laboratory courses are finding employment in public health laboratories, where they are said to give very efficient service.

We are glad to commend this undertaking, and we greatly hope that many young women of ability, education, and taste for public health work, may within a few months turn their faces toward public health schools and prepare themselves as thoroughly as possible for the numerous public health positions already open, as well as for the much larger number likely to fall vacant in the near future.

There is altogether too much tendency on the part of young men and young women to rush into army or navy service of one kind or another, to the neglect of the welfare of the civilian population upon which, after all, the war must depend for supplies and resources. General Gorgas was entirely right in emphasizing in one of his addresses before the American Public Health Association in October the fact that the physical and sanitary welfare of the Army and Navy is no more important than that of the civilian population upon which it depends; and the entrance of duly qualified and well trained young women into the ranks of public health workers will, we are sure, be welcomed by all who have the interests of the whole American people at heart.

W. T. S.

YOUR ANNUAL HEALTH REPORT.

This is the season of the annual health report. A few of the 1916 reports are still straggling in, but the wise health officer realizes that a prompt report is a sign of efficiency and that a stale report loses much of its force.

It is well to ask at the outset: Just what is the purpose of the health report? What is it to accomplish? To whom is it addressed, the Mayor, the Council, the doctors, the civic clubs, or just to the common people? Unless the health officer has the answer to these questions clearly in mind when writing his report, his document is not likely to be very useful.

While the typic reader and the purpose must necessarily vary with different reports, nearly every report should accomplish the following things:

1. It should justify the expense of the health department by giving a clear account of the activities during the year.
2. It should give an intelligible account of the money spent during the year.
3. It should state the health problems of the community, and present a program for solving them in so far as is possible.
4. It should give such statistical information as may be of value to the reader for whom the report is intended.

The account of the year's work is usually given in a satisfactory manner. However, very many reports sin in not giving a good statement of expense; yet no page is more interesting to the legislator who appropriates, the tax-payer who foots the bill and, in general, to the man who is interested in efficient health administration. A mere statement of disbursements for salaries, stationery, etc., is not sufficient: the classification should be according to functions. Then it is possible to determine whether a department is using its funds for activities that count, such as communicable disease control, infant welfare, health education, etc., or for work that has little or no public health significance, such as garbage collection or nuisance inspection. It is hoped that this year an increasing number of health reports will follow the scheme of statement outlined by Powers.* Then the health officer will be able to compare his expenditures with those of other cities.

Throughout the report, the writer should keep in mind the purpose of his report, and the reader whom he is addressing. Unless the report is intended for the professional sanitarian, the statistics should be selected and explained with great care. Probably most city reports waste valuable space upon tables which had better be left for the reports of the state or of the United States Census Bureau. A report which gives the local health problems in plain English, illustrated by a few significant figures or charts, will be far more useful in obtaining the desired appropriation than highly detailed statistical tables. Useless matter always detracts from the real message.

If statistics be given, let them be accurate. A report comes to mind which consistently referred to a birth-rate of *20 per cent.* Such a rate would be applicable to a community of guinea-pigs, but not to human beings. The use of statistics† is a science, and the careless user will surely come to grief.

Veiller has said: "A last year's bird-nest is of enormous utility compared with a lying reformer"—and a statistical liar is no better than the ordinary garden variety. Therefore the greatest care is necessary in quoting statistics, and in drawing conclusions from them; otherwise the statistics will act as a boomerang, and injure both the statistician and his cause.

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* G. L. Powers: "Uniform Accounts in Health Administration." U. S. Census Bureau, 1912.

† See J. W. Trask: "Vital Statistics and their Uses." Bulletin of the U. S. Public Health Service. Also "Report of Committee on Uniform Health Reports," AMERICAN JOURNAL OF PUBLIC HEALTH, Vol. 3, No. 6 (June, 1913). Unfortunately, single copies of this issue are no longer available.

Among the smaller cities which had attractive reports last year were Montclair and East Orange in New Jersey, and Palo Alto, Cal. The reports of Jacksonville, Fla., Richmond, Va., and of New York City also deserve study. In sending for reports, it is highly commendable to enclose postage.

A. W. H.

THE COMING FOOD NUMBER OF THE JOURNAL.

One of the gratifying features of the Washington meetings was the enthusiasm displayed at the sessions of the Food and Drugs Section. The meetings were well attended, and the papers were well chosen. One of the obligations of the health official at this time is to assist in the spread of the gospel of food conservation. It is, therefore, fortunate that we shall be able in the March issue of this Journal to present a number devoted largely to the problems related to the food supply.

◆

Association News.

By the Secretary, A. W. Hedrich.

Payment of Association Dues by Employers.—Many of our members feel that inasmuch as the services of the Association are a necessary part of their working equipment, the charge therefor should be paid by the employer, whether a health department or a private corporation. When requested, therefore, we are glad to address bills as follows:

Department of Health, Smithville, Mass.
Attention of Dr. A. R. Jones.

Doctor Jones will then be registered in our files and printed membership lists as the representative of the Smithville Health Department, entitled to all of the membership privileges. For simplicity in mailing, the bill and JOURNAL must be addressed in the same way.

Members who wish to have their stencils changed in this manner are requested to notify us at once, so that the new bills may be properly addressed when due.

⁂

Membership Certificates.—The Secretary has received a supply of membership certificates, neatly printed in two colors. One newly elected member writes: "Mine was spoiled by rain; please send another. I want to frame it."

Membership in the Association is a sign of progress. Why not send the Secretary three cents in postage and have a framed certificate in *your* office?

⁂

NOTE.—Help Wanted Announcements are published here free of charge.—EDITOR.

Help Wanted.—

Health Officer for New Jersey City. Salary: $1800. Address B. D. T., No. 99, care of this JOURNAL.

A local health officer for Massachusetts city of 40,000 population. M. D. required. Salary: $2,000 with increase. Address S. A. H., No. 98, care of this JOURNAL.

Chief operator in charge of water filtration plant wanted in a southern state. Salary: $2,100 per year. Address S. C., No. 99, care this JOURNAL.

First-class sanitary engineer who can handle laboratory end of water examinations wanted by a Nebraska health department. Salary: $2,000. Address W. F. W., No. 101, care this JOURNAL.

Two physicians wanted in a southern state to take charge of rural sanitation work in two counties. Salary: $2,000 and traveling expenses. Also four public health nurses are desired for visiting homes, inspection of schools, giving instruction where there is tuberculosis. Address R. A. L., No. 100, care of this JOURNAL.

Chief health officer and director of laboratory wanted in New Brunswick Province, Canada. The latter should have knowledge of clinical bacteriology, pathology, serology and possibly medico legal work. Both men under forty-five years of age. Salary to suit applicant if eligible. Address R. F. W., No. 97, care this JOURNAL.

Man wanted to take charge of water filter operation of southern city and military camp. Salary: $1,800 to $2,000. Address S. W. C., No. 96, care this JOURNAL.

⁂

Experiences with the New Standard Methods of Water Analysis.—An article by H. E. Hasseltine in the *Public Health Reports*, November 9, 1917, criticises certain of the methods given in the third Report (1917), of the Committee on Standard Methods for the Examination of Water and Sewage. His criticisms are as follows:

The Standard Methods require that all media shall be sterilized in the autoclave at 15 pounds (120° C. for 15 minutes after the pressure reaches 15 pounds). Comparative tests of water samples with lactose broth sterilized in this way and lactose broth heated after the addition of the carbohydrate to 100° C. for 30 minutes showed a much higher incidence of gas formation with the former. This results in a false increase in positive presumptive tests and increases the number of tubes to be plated when confirmatory tests are to be carried out. In lactose broth sterilized at 15 pounds pressure, *B. proteus* was found to produce gas and would conform therefore to the requirements given in the Standard Methods. Based on the results of confirmatory tests Hasseltine believes that the formation of less than 10 per cent of gas should be disregarded. The Standard Methods classify as a member of the

B. coli group any non-sporing bacillus which fished from Endo shows gas formation in forty-eight hours. On comparative tests the Endo medium recommended in the Standard Methods was found to give numerous atypical colonies with *B. coli.* The development of atypical colonies is due to the fact that the amount of fuchsin and sulphite is insufficient to give optimum coloration of the *B. coli* colony.

These results were presented by Hasseltine at the meeting of the Laboratory Section at Washington. They raised considerable discussion, questioning as they do the basic validity of the bacteriological portion of Standard Methods. The claims will doubtless be investigated by the Committee on Bacteriological Methods, of which Prof. Fred P. Gorham is chairman. The report of this committee and the contributions of other observers should form an important part of the proceedings of the Laboratory Section at the next annual meeting.

⁂

Old Journals Wanted.—In order to complete a few files of the American Journal of Public Health, and of the transactions of the Association, we offer to buy the issues listed below. We are prepared to pay 25 cents per copy for the single issues required, or $1.25 for the complete volume of the year in question:

Transactions of the A. P. H. A. Wanted: Nos. 3, 5, 6, 15, 16, 17, 27, 28, 33, 36, at $1.00 per volume.

American Journal of Public Hygiene. Wanted: Vol. 1–6, at $1.25 per volume.

American Journal of Public Health. Wanted: Vol. I (1911). Issues of April, May, and June, at 25c. Also complete volumes at $1.25.

Vol. III (1913). Issues of January, August and September, at 25c. Also complete volumes at $1.25.

Vol. IV (1914). Issues of September and January at 25c.

If you have any of these to sell, please write at once to the Secretary at 126 Massachusetts Ave., Boston, Mass.

Medical and public health libraries which desire to install a file of this Journal will do well to apply at once for one of the very few sets now on hand. In a very short time these will no longer be obtainable.

The following have been elected to membership in the American Public Health Association:

Amy Morris Homans, Wellesley College, Mass., Professor of Hygiene.

Pansy V. Besom, R. N., 16 Moore St., Winthrop Beach, Mass.

James S. Mitchener, M. D., Kingston, N. C., County Health Officer.

Paul M. Holmes, M. D., 22 Norwood Court, Toledo, Ohio, Physician.

Bernard J. Newman, 7734 Norwood Avenue, Philadelphia, Director Pennsylvania School for Social Service.

Charles D. Mare, Stanford University, Cal., Engineer and Professor of Civil Engineering.

J. Treichler Butz, M. D., Allentown, Pa.

Irving M. Cashell, Goldsboro, N. C., Veterinarian, Health Officer and Bacteriologist.

Robert D. Hamilton, M. D., Newburyport, Mass., Physician.

H. E. Hitchcock, M. D., Houlton, Me., district Health Officer.

Thomas G. Hull, Washington, D. C., U. S. Food Administration.

J. A. Hunter, Pittsburgh, Pa., Steam and Sanitary Engineer.

Kenneth M. Lynch, Charleston, S. C., Professor of Pathology and Research Medicine.

Frank C. Mantel, Memphis, Tenn., City Chemist and Bacteriologist.

Frank I. Mayer, Newark, Ohio, Bacteriologist.

Annetta J. Nicoll, Topeka, Kan., City Bacteriologist and Food Inspector.

Paul S. Nice, Denver, Col., Bacteriologist.

Raymond O'Donnell, State College, Pa., Professor in Civil Engineering Department.

Andrew G. Sandblad, McKeesport, Pa., Physician.

John W. Tapper, Lynn, Mass., Chairman, Board of Health.

R. P. Albaugh, M. D., Columbus, Ohio, Director, Division of Industrial Hygiene.

F. C. Wells, M. D., New York City, Medical Director Equitable Life Assurance Society.

Harrison Hale, Springfield, Mo.

W. C. Dumas, Atlanta, Ga., Chemist.

Miss Lula M. Preston, Statesville, N. C., Nurse.

C. L. Rice, Lowell, Mass., Sanitary Engineer.

Henry J. Ramsey, Washington, D. C., Pomologist.

Dr. Everitt A. Wimson, Perth, Australia, Health Official.

Professor Warren C. Taylor, Schenectady, N. Y.

J. K. Gore, Newark, N. J., Vice-President and Actuary, Prudential Insurance Company.

Lydia A. DeVilbiss, M. D., Topeka, Kan., Director Division Child Hygiene.

R. E. Lee, Meadville, Pa.

Drs. C. A. Bower, A. S. Jackson, and C. E. McCauley, members South Dakota State Health Board.

✣

The New Health Commissioner of New York City.—J. Lewis Amster, M. D. was born in New York City in 1879 and attended public schools and the College of the City of New York. He is well known to his colleagues for his interest in all matters relating to the medical profession. He is active in the affairs of the Bronx County Medical Society of which he was at one time vice-president and is now president. In the latter capacity Doctor Amster has taken an active part in promoting coöperation between the physicians of the Bronx and the Department of Health.

He is Associate Surgeon, Lincoln Hospital, Bronx. In addition to this Assistant Visiting Surgeon, Penitentiary and Workhouse Hospital; Instructor in Surgery, Polyclinic; Consulting Surgeon, Home for Aged and Little Sisters of the Poor; Member of the American Medical Association and of the Clinical Congress of Surgeons of North America.

In a recent statement, Doctor Amster said: "The work of the Department of Health is perhaps the most important activity carried on by the municipality. The present organization has been built up as the result of years of labor.

"I realize that the duties of this important office are tremendous and I am satisfied responsibilities can be made lighter, if coöperative measures are immediately established between the Department of Health and the physicians of this city. Only with such coöperation and mutual understanding can the efficiency of the Health Department be maintained."

✣

We have just learned that Prof. Otto Rahn, formerly of Urbana, Ill., has been detained in Germany. He returned to Germany in July, 1914, to visit his parents and was caught by the war. The latest news from him indicated that he was drafted into the German army as a chemist with the Aeroplane Service on the Russian front.

Miss Gertrude Seymour, Health Editor of *The Survey*, is on leave of absence and will, during the immediate future, be employed with the Council of National Defense, Medical Section.

Dr. E. S. Tenney, until recently State Health Commissioner of Nebraska, has resigned and is now a Major in the Medical Reserve Corps. He is at present an instructor in military hygiene and sanitation at the M. O. T. C., Fort Riley, Kan.

Dr. Haven Emerson, until recently Health Commissioner of New York City, has departed for France as a Major in the Medical Reserve Corps.

Dr. Andrew Jackson Warren of Hillsboro has been appointed Health Officer by the State Board of Health of Rowan County, N. C., to relieve Dr. L. J. Smith who has been transferred to Wilson County in the Officers' Medical Reserve Corps.

Mr. A. R. Murphy of Wallace & Tiernan Company of New York City is associated with the army Engineering Corps, Water Supplies Division, and expects to be in France in the near future.

Francis E. Daniels, Assistant Engineer with the Pennsylvania State Department of Health, has accepted a commission as Captain in the Sanitary Corps of the National Army. He has been assigned for duty to Camp Greene, Charlotte, N. C.

Mr. H. G. Parker, formerly Bacteriologist of the Department of Health at Norfolk, Va., has enlisted in the army and is now on duty in Washington, D. C.

Assistant Surgeon-General W. C. Rucker of the United States Public Health Service writes that he is in preparation for a European detail.

Dr. Ramon Guiteras of New York City, one of the best known members of this Association, died in New York City December 13, 1917, of meningitis.

Dr. William Levin, First Lieutenant, Sanitary Corps, is located at the Base Hospital, Fort Riley, Kan.

Mr. John O'Neill of New Orleans is now a Captain in the Sanitary Corps, stationed at Camp Sheridan, Ala.

Books and Reports Reviewed.

Impotence, Sterility, and Sex Gland Implantation. *G. Frank Lydston, M. D., D. C. L. The Riverton Press, Chicago, Ill. 1917. 333 pp. (illustrated). Price $4.00.*

This monograph on the diseases and aberrations of the sex function contains a great amount of the original work which Doctor Lydston has already published in the *New York Medical Journal*, the *Journal of Urology*, and other medical journals. The chapters on sterility, sex aberrations, and sterilization, are recommended by the author to the attention of the legal profession. The work deals with hermaphroditism, precocious sexuality, sex perversion and inversion, impotence, sterility, masturbation, spermatorrhea, and sexual neurasthenia, but by far the most valuable chapters in the book are the three dealing with the author's own work as well as other experimental work in sex gland implantation.

Excellent photomicrography is shown in the cuts in these chapters. Doctor Lydston claims to have been the first person to implant an entire human testis for therapeutic or experimental purpose and his was the first successful implantation of human sex glands taken from the dead body. He can justly claim the credit for much original work, and from his researches he concludes that sex gland implantation from living or dead bodies is practicable, that the benefits accrue irrespective of the site of implantation, and that the internal sex gland secretion is stimulant, nutrient, tonic, and re-constructive, and should increase the resistance to disease; and that any chronic disease in which improvement of nutrition is desired such as tuberculosis, anemia, etc., would be benefited by sex gland implantation. He holds also that senility can be retarded and longevity possibly increased by this means. He has used such implantation in the treatment of impotence in the male and in sterility in both sexes and in certain cases of skin diseases. Such diseases as chronic nephritis and diabetes, as well as arterio sclerosis, seem to indicate implantation. The author also makes the general claim that successful "implantation" ought inevitably to increase physiologic efficiency with all the benefits accruing therefrom. The author holds that perversion of the quality or lessening of the quantity of the sex hormone formed in the glands that produce the parental germ cell or sperm cell, or both, is the biologic foundation of both psychic and physical aberrations of sex differentiation, and believes that the abuses of sexual physiology can be combated only upon purely physical grounds. This point of view is not entirely consistently maintained. The tone of parts of the book seems distinctly "gossipy."

D. B. Armstrong, M. D.

Suggestions to Authors and A. M. A. Style Book. *American Medical Assn., 535 N. Dearborn St., Chicago. 68 pp. 1917. Paper, 10 cents.*

First have something to say, then say it briefly and simply in clear, definite language reduced to manuscript form with a short, explicit title, clear, descriptive subheads and a carefully prepared summary and conclusions, are suggestions contained in this 68-page publication recently issued by the American Medical Association. Compliance with the many valuable suggestions contained in this pamphlet would be greatly appreciated by the many editors and hosts of readers who are obliged to wade through volumes of all but useless rubbish in the quest of something really worth while. The book will be useful to public health authors as well as to writers on strictly medical subjects.

The subject matter is divided into three parts. Part I is of special use to authors, and deals with the writing of an article, the preparation of the manuscript, the use of illustrations, tables and charts, and proof-reading by the author. The points are then summed up in short, sentences of which the following are concise examples:

Plan your paper before you write it.

Make your title descriptive but brief.

Write in a simple, careful, grammatical style.

Delete all nonessential words, phrases, sentences and paragraphs.

Send the original, not the carbon copy, to the publisher.

Fold, do not roll, manuscripts.

Illustrations must illustrate.

Provide a legend for each illustration.

Number tables and illustrations, and refer to these by number.

Part II is the style book which gives typographical rules governing uniformity in composition, with suggestions for the editing of copy. These include rules as to spelling, use of the hyphen, words frequently confused, capitalization, style of military terms, numbers, abbreviations and prescriptions.

The last section, part III, deals with bibliographic style in footnotes and references, and gives a list of the full and abbreviated titles of the world's more common periodicals devoted to medicine and allied sciences. As this list includes nearly seven hundred different periodicals, it may be regarded as sufficiently complete for ordinary reference purposes.

Millard Knowlton, M. D.

A Course in Food Analysis. *Andrew L. Winton, Ph. D. New York: John Wiley & Sons, Inc., pp. 252. Price $1.50 net.*

This book, designed for the student, purposes to "start the student upon the right road to . . . become a professional food analyst," and also purposes to substitute food analysis for the usual courses in qualitative and quantitative analyses given to those students who do not propose to make a profession of chemistry. The student is given more instruction with respect to analytical processes and at the same time gains an intimate knowledge of the chemistry of life. Doctor Winton, having been in charge of the laboratory of the Connecticut Agricultural Experiment Station and the Chief of the Chicago laboratory of the United States Department of Agriculture, as well as spending a portion of his life in teaching, is well qualified to prepare such a book. The methods selected cover the analysis of milk and milk products, meat, fish and eggs, cereals, legumes, vegetables, spices, saccharine products, fats and oils, fruits and fruit products, flavoring extracts, and tea, coffee and cocoa. The methods are up-to-date but consist mostly of those not likely to be changed or to become obsolete in the near future. One entire chapter, the longest in the book, is devoted to microscopical examination of foods.

The subject of adulteration is not extensively treated; in fact, it is ignored to a considerable extent, except in those cases where it explains the necessity for the test. For example, the value of the iodine number of fats and oils in detecting adulterants is not mentioned, although the use of cottonseed oil as an adulterant is mentioned under the Halphen test. The author discusses the preservative question "pro and con" in a very satisfactory manner. He states, however, "the use of sulphites in Hamburg steak and sausage is objectionable if for no other reason because it permits the marketing of decomposed meat, serving not merely as a preservative but as a deodorizer."

It is a well known fact that sulphites cannot act as described above. The preservatives best capable of "deodorizing" decomposed meat are spices. The reviewer has found sausages made from rotten meat and so highly spiced that their origin was apparently beyond reproach. On the contrary, he has seen attempts made to deodorize meat with sulphites and the resulting mass when sold was distinctly obnoxious to the senses, even with 1 per cent of sulphite present.

This book is not intended for the practicing food analyst, but it should be carefully studied by teachers who desire to establish courses in food analysis or who are dissatisfied with the text-books they are using and desire to make a change for the better.

Hermann C. Lythgoe.

Food Value of the Banana. *Published by United Fruit Company, Boston.*

This is an advertising booklet of 34 pages, consisting of an article on "The Banana: A Food of Exceptional Value" by Prof. Samuel C. Prescott, and several subsidiary articles upon the same subject, taken from the various published works of well known scientists and health officers.

The article by Professor Prescott was presumably written for this publication, although it has since appeared in the *Scientific Monthly* for January, 1917. It endeavors to point out the high caloric value, easy digestibility, general wholesomeness and relative cheapness of this tropical fruit, and a table compiled from the figures of Sherman is introduced to show the favorable comparison between bananas and 31 other foods. The only new material claimed by the author is a very complete analysis of the ash of the banana. Bananas contain about 35 per cent refuse. Regarding this the author states, "Since, however, bananas are ordinarily not purchased by weight, but by number, this does not enter into the general question of either cost or food value." In practice bananas are sold wholesale by weight and the retailer adjusts this by charging different prices, according to size of the individual bananas.

The balance of the articles are well chosen and the booklet fills its purpose without making the extravagant, sensational and oftimes erroneous claims found in publications of a similar nature.

Hermann C. Lythgoe.

Communication.

Editor, American Journal of Public Health:

In Dr. E. C. Rosenow's article, "Results of Studies on Epidemic Poliomyelitis," in your December number, certain statements are made which directly bear upon some original work done by me, previously published (*Medical Record*, 1, 13, '17; *J. of Laboratory and Clinical Medicine*, 7, '17), but to which your author does not refer. I, therefore, trust that you will give space to this communication.

Doctor Rosenow states, in reference to the organism of the disease: "Transplants from one to another of these liquid mediums disclose a marked tendency of the microörganism to change to the form characteristic of the medium in which it is planted. . . . '*Frequently, elongated forms resembling diphtheroid bacilli or distinct rods are found in chains which are made up chiefly of typical diplococcus forms.*"

In the articles referred to, I showed how the organism could be grown as a streptococcus-like organism and, at will, developed into a bacillus—apparently of the distemper group—of which the qualities were given in detail. To effect the development from "coccus" to bacillus, a new method, involving the use of serum-bouillon containing *lime-water*, was described. I particularly mentioned that I had secured the same results with two cultures of Doctor Rosenow's isolation, which he had very kindly sent me for comparison. (In the *Medical Record* article he is mentioned by name as the source of two of the cultures employed; and in the article in the *Journal of Laboratory and Clinical Medicine*, his two cultures are referred to as from "a western bacteriologist.")

As it is evident from the foregoing quotations from Doctor Rosenow's article that he now believes that his "coccus" can develop a bacillus form, and as this change was one of the main points brought out by me I trust I will be excused my desire to claim credit accordingly.

To more fully explain my position I quote some conclusions, given in my article, last referred to.

"It is demonstrated that the organism isolated from the nerve centers of cases of poliomyelitis (including the "streptococcus" described by various observers) is a pleomorphic bacillus of the distemper group, which varies in characteristics much as the various, supposedly different, members of the group do from one another; that this poliomyelitis bacillus could cause paralysis in cats, dogs, rabbits, and guinea pigs, and that an accidental passage of a culture through man gave rise to abortive symptoms of the malady; that after this last named passage it could produce paralysis in a rabbit, and a contagious infection of guinea pigs, with nerve center lesions; and, finally, that from the guinea pigs it could produce distemper in cats."

I will add, further, that in an epizoötic of paralysis among dogs, which occurred last spring in Queen's Borough, New York City (reported by Dr. W. L. Johnson and myself in the *Medical Record* of November 17, last), a similar bacillus was found to be the causative organism.

Respectfully,
Horace Greeley.

140 Clinton Street, Brooklyn, N. Y.
January 15, 1918.

Public Health Notes.

Abstracted by Dr. M. E. Champion, M. P. Horowitz, and R. R. Harkness.

Public Health Ministry for Austria.—"An Imperial Decree was issued on June 1, 1917, constituting a Ministry of Public Health and Social Welfare for Austria. It is to supervise the care of war invalids, to combat war diseases, and to centralize preëxisting, uncoördinated departments of public health and sociology. It is to have the care also of the dependents of fallen soldiers, infant welfare, housing and insurance. Though the medical profession is to be liberally represented, the first Minister, Doctor Baernreither, is not a medical man. One of the most important problems to be solved by the new ministry is the future of the numerous war hospitals, which have cost much labor and money."—*British Medical Journal, Dec. 15, 1917.* (*Peter H. Bryce.*)

✱

Fifth Annual Report of the United States Children's Bureau.—Miss Julia C. Lathrop, Chief of the Children's Bureau of the United States Department of Labor, analyzes the work done in the annual report for 1917. The report discusses the Child Labor Act and its enforcement; infant welfare, with special reference to the care of maternity and infancy; child welfare work in the warring countries; recommendations for child welfare work in war time; soldiers compensation and insurance; problems of dependency and delinquency as affected by the war; and lastly, a plan for public protection of maternity and infancy with federal aid.

During the year, 300,000 children under 5 years of age died. The infant mortality rate for the birth registration area in 1915 was 100, and the most favorable rate for a state was 70. This was for Minnesota. During 1916, New Zealand reported an infant mortality rate of 50. The point is made, that much can be done in this country to reduce the present infant mortality rate.

Since the Bureau was founded, field studies have been made in Johnstown, Pa., Montclair, N. J., Manchester, N. H., Brockton, Mass., Saginaw, Mich., New Bedford, Mass., Waterbury, Conn., Akron, Ohio, and Baltimore, Md. A very interesting correlation between infant mortality and the father's earnings was brought out. It was shown that the infant mortality rate varies inversely as the amount of the father's earnings. It was also shown for Manchester, N. H., that where the father's earnings were small, the mother would frequently be gainfully employed following the baby's birth.

The report recommends the following war time program.

1. Public protection of maternity and infancy.
2. Mothers' care for older children.
3. Enforcement of child labor laws and full schooling for all children of school age.
4. Abundant and decent recreation for children and youth. (*M. P. H.*)

✱

Smallpox Vaccination.—The United States Public Health Service in the Public Health Reports for November, 1917, has the following recommendations regarding smallpox vaccination:

Fresh vaccine should always be employed, and should be carefully iced pending use. The operation of vaccination should be performed not by cross scratching, but by one of three methods: (1) linear incision about one-fourth inch long using a needle or similar instrument; (2) drill method with a Von Pirquet scarifier; (3) multiple punctures with a sterile needle through a drop of virus and just through the epidermis. The punctures should be confined to an area not more than one-eighth inch in diameter. The first two methods necessitate allowing the vaccine to dry on the arm. After care of the vaccination wound calls chiefly for cleanliness; shields and similar devices should be avoided. The crust which forms should be preserved intact.

Vaccination is indicated by the time the child is six months old; it should be repeated at about 6 years of age and whenever smallpox is epidemic. (*M. E. C.*)

✱

A School Inspection Manual.—*Health Notes,* the monthly bulletin of the Florida State Board of Health, for January, 1918, is devoted to medical inspection of school children and to school sanitation.

A well-written editorial emphasizes the necessity and importance of medical inspection of school children, and the problems of school sanitation are discussed in an article by George W. Simmons, Jr., Chief, Bureau of Engineering, State Board of Health. Specimens of the forms in use for the examination of school children are shown, and complete instructions to district health officers, nurses, and teachers for making the inspections are included. Excellent bibliographies of the literature on these subjects appear in the bulletin.

Health officers and others interested in this important phase of health work will be repaid in examining this number of the Florida *Health Notes.* (*R. R. H.*)

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Cups and Glasses must be Washed in Boiling Water.—According to the *Municipal Journal* for December 22, 1917, the California State Board of Health has recently promulgated a new regulation, which requires that all drinking cups and glasses used in restaurants, at soda fountains and other places must be washed for five minutes in boiling water containing 5 per cent of lye. (*M. P. H.*)

⁂

Infant Care in Rural Districts.—A recent report of the Children's Bureau of the United States Department of Labor deals with the available facilities for the care of mothers and babies in rural districts. This particular report is based on studies made in a single county in Kansas. Most of the families studied were those of farmers or farm workers, and were fairly well-to-do. Telephones and good roads were the rule. No family was further away from a doctor than 20 miles.

The results brought out were these: Two-thirds of the mothers had no prenatal care at all and more than one-third had no postnatal medical care. Moreover among those credited with having such care, few instances were found where the care was adequate. Four-fifths of the farmers' wives had to do heavy housework until near the time of confinement. The infant mortality was found to be 40 per thousand births—a low figure for city conditions, comparatively high for a prosperous rural county.

Work now being done in poorer districts by the same bureau points toward results correspondingly more unfavorable.

The Children's Bureau is urging more adequate medical and nursing care through hospitals, conference centers, and more doctors and nurses. The suggestion is made that the establishment of a rural nursing service may be the next step for such counties as the one studied. (*M. E. C.*)

⁂

Purification of Distilled Water.—It is quite possible that distilled water can be contaminated during the process of ice making if due precautions are not taken, says Harry B. Hommon, in *Ice and Refrigeration, for November, 1917.* This experience was made near a cantonment in a city which was under the supervision of the United States Public Health Service. This particular plant furnished more than fifty per cent of the ice used in the city. A typhoid fever outbreak focused suspicion upon the ice plant. To all appearances the distilled water ice plant operated faultlessly; however, a more thorough investigation brought out the facts that the sterilization of the filters did not properly function, and that as a consequence the water subsequently remained contaminated. A remodeling of the plant gave the desired result. The typhoid outbreak in the city was not laid to the impure ice produced but the investigation showed that the plant was at least a potential source of disease. (*Arthur Lederer.*)

⁂

Danger from Wood Alcohol Bath.—Dr. John M. Robinson of Duluth, Minnesota, writing in the *Journal of the American Medical Association* calls attention to the dangers of methyl alcohol. He quotes the record of a patient who had marked impairment of vision as the result of daily baths for two weeks with wood alcohol. Another man had sudden blindness come on after having rubbed his legs with wood spirit each day for a month. The author reports a case of his own who showed symptoms of wood alcohol poisoning apparently as the result of having worked at dyeing hats with a commercial product containing 4 per cent wood alcohol.

(*M. E. C.*)

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County Control of Measles.—According to the *Medical Officer* for November 24, 1917, Dr. W. G. Savage recommends the employment by counties, of nurses, whose duty it shall be to visit the homes affected with measles, in order to give home treatment and advice. The work may be enlarged to include whooping-cough and general hygiene. At the present time very little is done in this way within the county. The article refers particularly to the County of Somerset, England. (*M. P. H.*)

⁂

Ohio Plans to Save Mothers.—The Ohio State Department of Health, through its Division of Child Hygiene, is about to launch a new enterprise—a bureau of registration for mothers. Thus writes Dr. Frances M. Hollingshead, director in charge of the work, in the December *Ohio Public Health Journal.*

The United States stands thirteenth in a group of fifteen countries with regard to loss of life from childbirth. There are two outstanding causes for existing conditions: first, the lack of available facilities for many women; second, the almost dense ignorance among part of the women in all walks in life.

Doctor Hollingshead states that "the first step in the prenatal campaign will be that of establishing in the State Department of Health a confidential registration of mothers—a bureau where pregnant women may register and from which information may be sent out. As long as possible, the answers to questions and information given out will be of a purely personal nature."

An attempt will be made to give sane and safe information to women in industry and to those women who have the family duties to perform, regarding work before and after confinement.

It is believed that this work will relieve the busy practitioner and yet will not disturb the relationship between family and physician. (*R. R. H.*)

⁂

A Public Health Car in Kansas.—By converting an unused Pullman Coach into a travelling exhibit, the Kansas State Board of Health has been giving the people of the state an opportunity to see, as well as hear, truths regarding health, and reasons for obtaining more public health nurses.

All of the departments of the State Board of Health and the Kansas Association for the Study and Prevention of Tuberculosis are represented in the exhibits.

The car is in charge of two public health nurses who describe the exhibits and give short talks on the value of public health nursing.

This interesting method of health education is described by Margaret McKnight in the November *Bulletin* of the Kansas State Board of Health. (*R. R. H.*)

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Public Health Nurses and Army Camps.—Fifty Public Health nurses have been assigned for duty by the American Red Cross to the zones around the National Army cantonments, National Guard camps, and naval bases. The nurses will work under the Red Cross sanitary directors in coöperation with the local, state and federal health authorities. Nurses have already taken up their work in civil districts around cantonments at Hattiesburg, Miss.; Fort Riley, Kans.; Des Moines, Iowa; Louisville, Ky.; Little Rock, Ark.; Ayer, Mass.; Chillicothe, Ohio; Atlanta, Ga.; Newport News and Petersburg, Va. As visiting nurses in the rural territory and cities adjoining the camps, the Red Cross nurses assigned to public health work will endeavor to prevent the spread of tuberculosis, malaria, and social diseases, and to strengthen the local infant welfare programs.

Sanitary units of the Red Cross are to be placed at the disposal of the Public Health Service and state and county health authorities. Specifically, they will aid constituted officials in insuring the purity of milk and water supplies, and in cleaning up unsanitary places near the camps which might be dangerous as germ incubators. The inspectors will patrol the territory surrounding camp limits to enforce sanitary regulation in coöperation with the sanitary officers of the Army.—*Public Health Nursing, November, 1917.* (*R. R. H.*)

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Smallpox in Pennsylvania.—The *Municipal Journal* for December 6, 1917, quotes Dr. Samuel G. Dixon to the effect that smallpox is prevalent in 12 counties, and that 38 patients are under quarantine. Ohio also has many cases, and Cumberland, Md., just across the border, has 10 cases. The coöperation of the public and the physicians is requested in locating every possible case. (*M. P. H.*)

Overcrowding in East Chicago.—From clippings furnished through the courtesy of Mr. H. G. Osborn, City Health Inspector, we learn that due to the influx of thousands of workers needed to make munitions and other war materials, East Chicago, Indiana, is confronted with a serious problem of overcrowding, and a shortage of houses. The Indiana State Board of Health has ordered the local health authorities to enforce the housing law and general sanitary ordinances of the city. To enforce the housing law will mean the ejection of 500–600 people out of a population of 30,000 from their present homes, and probably will force them out of the city. An attempt will be made to have the industrial concerns furnish funds with which to supply more houses to relieve the present congestion. This is necessary if the workers are to be retained and the efficiency of the industrial plants maintained. (*M. P. H.*)

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What Can Be Done with Garbage.—New York City's garbage, by treatment in a $3,000,000 recovery plant of the latest type on Staten Island, yields the following commercial products:

Grease for 70,000,000 cakes of soap; 1,500 tons of nitrogen; 2,000 tons of phosphoric acid; 500 tons of potash. With the nitrogen, and the glycerin from soap making, there is a recovery of material yielding 3,500,000 pounds of high explosives, while the phosphoric acid and potash, as well as the nitrogen, are valuable in the making of commercial fertilizers.

This plant operating under the so-called Cobwell process, which treats garbage almost entirely by chemical methods, has effected increased recoveries of valuable products amounting to at least 25 per cent. more than recoveries under the best previous reduction methods used for New York's garbage. In soap, for instance, there is an additional recovery of grease for 10,000,000 cakes a year, and in high explosives material for 700,000 pounds.

Under a contract with the city the Metropolitan By-Products Co. (Inc.), takes all the garbage from the Boroughs of Manhattan, The Bronx, and Brooklyn for a period of five years, beginning with 1917, paying $900,000 for the raw garbage during that period. Garbage is deposited on scows along the Hudson and East Rivers and hauled to the plant during the night. The chemical treatment followed not only eliminates all odors incident to the old boiling process, by which garbage was cooked for a long period in water, but saves many of the rich chemical elements which were formerly lost. Under the old process it is said a large percentage of these elements were cooked into a rich soup, and then the soup was thrown away. Moreover, a considerable percentage of grease was burned by the high temperature driers used before degreasing, and the cooking process had a splitting effect upon the material which led to considerable losses of glycerin, which ran away in waste water. The new process saves these materials. The plant required is more expensive to install, but much more economical in operation.—*Weekly Bulletin, United States Food Administration.*

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Typhoid Fever.—P. S. Schenck, Norfolk, Va. (*Journal American Medical Association*, October 27, 1917), gives an account of a small epidemic of nineteen cases of typhoid fever caused by the patients eating turkey salad at a reception given by a local club. The salad was made by a colored caterer of local reputation. Six of the reception guests who partook of the salad came down with typhoid fever within fourteen or sixteen days afterward. After the reception a bowl of salad was sent to an orphan asylum in which there were eight little girls, six of whom took the disease. One of the colored women who assisted in preparing the food ate some of it and gave some portions of it to her two children and to her brother who visited her. Another colored woman, who also assisted, carried some home and gave it to her two children and also her two nephews, all four of whom came down with typhoid. All these patients had the usual period of incubation, except one of the colored women, who developed typhoid fever within three days after the reception. She, however, had been taken sick two weeks before the reception although she had not taken to her bed in the interim previous to developing typical typhoid. Other causes, such as water, milk supply could be excluded in all the cases.

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" 'Tis a wise community which places community health above all other community possessions."—*North Carolina Health Bulletin.*

Industrial Hygiene and Sanitation.

Abstracts prepared by Drs. F. R. Hayhurst, R. P. Albaugh and P. M. Holmes.

Sanitary and Engineering Industrial Standards. *Bureau of Hyyiene and Sanitation (John Roach, Chief), Department of Labor, New Jersey,* Trenton, N. J. 36 pp. This pamphlet, which is well indexed, gives the minimum sanitary regulations for washing facilities, dressing rooms, toilet facilities and drinking water, then follows a description of the methods for computing the size of exhaust systems and for the construction and installation of them for dust, fumes, heat and humidity. The application of such systems to fifteen different industries is separately delineated. The department furnishes blue prints for various installations.

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Safety Standards for Lead Corroders and Lead Oxidizers, Paint Grinders, Dry Color Manufacture. *Bureau of Hygiene and Sanitation (John Roach, Chief), Department of Labor, New Jersey,* Trenton, N. J. 28 pp. Three sections of the enabling act, which provided for the prevention of lead poisoning and other occupational diseases in the State of New Jersey, introduces this excellent set of regulations or standards which amplify these sections. The provisions of the Standard Lead Bill, fathered by the American Association for Labor Legislation, are greatly extended both by law and by these regulations of the Department of Labor in New Jersey. Hence the users or handlers of these substances are covered by law as well as the pure-process manufacturers, which is all that is specified in the Standard Lead Bill. Instructions to employes and the blank form used in reporting are given for all of the hazards in industries mentioned in the title.

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Safety Standards for the Manufacture of Nitro and Amido Compounds. *Bureau of Hygiene and Sanitation (John Roach, Chief), Department of Labor, New Jersey,* Trenton, N. J. 18 pp. New Jersey and Pennsylvania are chief centers for the manufacture of high explosives and the loading of the same into projectiles. In both states regulations have been drawn up for the prevention of occupational diseases in the handling of the poisonous substances used, principal among which are the nitro and amido compounds of the aromatic series. Precautions in building construction and for the various processes of manufacture are given as well as specific health precautions, minimums for physical examination, and reporting forms, while special emphasis is laid upon trinitrotoluol, acid fumes and the handling of chemicals.

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Industrial Fatigue in Its Relation to Maximum Output. H. J. Spooner, Copartnership Pubs., London, 1917.

⁂

Death of Professor Rambousek. The death is announced at the age of 43, of Dr. J. Rambousek, professor of factory hygiene, and chief state health officer, Prague. *Science,* December 28, 1917.—Rambousek's book "Industrial Poisoning," translated by Thos. M. Legge 1913 (Edw. Arnold, London), is still the standard work upon this subject.

⁂

Ventilation Laws in the United States. Also Board of Health Requirements and Regulations of National Board of Fire Underwriters. Together with Model Ventilation Requirements as Promulgated by the American Society of Heating and Ventilating Engineers. Third revised edition, *Heating and Ventilating Magazine Company,* 1917, 1123 Broadway. Price, $1.00. 178 pp., cloth.

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The Edison Lamp Works of the General Electric Company, Harrison, New Jersey, has issued a number of booklets and bulletins upon illumination, among which are to be specially mentioned (1) The Lighting Handbook, 94 pp.; (2) Handbook on Incandescent Lamp Illumination, 1916, Vest Pocket Edition, 212 pp.; (3) Engineering Data on Incandescent Lamps, August 1, 1917, 25 pp. and (4) Bulletins—these are issued upon the lighting of various forms of interiors as well as flood lighting.

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Is Death from High Temperature Due to Accumulation of Acid in Tissues? A. G. Mayer. *American Journal of Physiology,* Baltimore, November, 1917, XLIV, No. 4, p. 581. Apparently, death from high temperature is due to the accumulation of acid in the tissues, possibly carbonic acid. It is not due to asphyxiation.

◆

Brachial Neuritis and Sciatica. H. T. Patrick, *Journal, Amer. Med. Assn.*, December 29, 1917, p. 2176–2179, illus. The great prevalence of aches and pains in the arms and legs of industrial workers makes this article by Patrick, which is chiefly one of differential diagnosis, one of especial interest. Several new diagnostic points are described.

◆

Ventilation Standards and the Synthetic Air Chart. E. V. Hill. *Journal of the American Society of Heating and Ventilating Engineers*, July, 1917, pp. 477–498. In this valuable contribution Doctor Hill discusses the development of graphic representations of air condition findings and the results of his numerous experiments. In the end, he has devised a so-called synthetic air chart by the use of which the "per cent of perfect" may be indicated for all of the usual hazards encountered in determining the condition of ventilation in given quarters. The method appears to be a most convenient one for recording test data.

◆

Notes on the Testing of Heating and Ventilating Equipment. D. D. Kimball, J. I. Lyle and Arthur K. Ohmes. *Journal of the American Society of Heating and Ventilating Engineers*, July, 1917, pp, 595–624. This article is of the utmost value to industrial hygienists in that it describes testing methods and apparatus which should be considered standard in determining ventilating conditions and also briefly summarizes the methods or mechanics of securing proper heating (or cooling) and ventilation.

◆

Congress of Human Engineering. *Ohio State University Bulletin*, Vol. XXI, No. 12, 1917, 160 pp. This congress, which was held at Ohio State University, brought together a number of persons prominent in the vanguard of industrial betterment in the United States, representing manufacturers, workers and social economists. The various papers have to do principally with the ideals to be attained.

◆

British Reports on Hours of Work, Output and Fatigue. *National Industrial Conference Board*, 15 Beacon St., Boston, November, 1917, 57 pp. This is a critical analysis of the preliminary reports of the Health of Munitions Workers Committee of Great Britain. The National Industrial Conference Board is now investigating the same subjects of itself, but finds it timely to discuss these British reports more as a matter of information than to set forth conclusions. The board takes definite exceptions to some of Dr. H. M. Vernon's specific conclusions principally because of the limited scope of the data and says that the report of Professor Kent should be disregarded because inferences or conclusions were drawn from too small groups of workers and too brief periods of time. As the report represents the best criticism which has so far appeared concerning these British investigations, it should be read in full.

◆

Garage Workers and Motorists. *Natl. Safety Coun., Chicago, Bull. Bd. Ser. No. 485.* This one-page poster, adapted from a leaflet of the Ohio State Department of Health, gives timely publicity to the dangers of motor gas poisoning, or gasoline engine exhaust fumes, and the methods of eliminating the danger.

◆

Decisions of Courts Affecting Labor; 1916. *U. S. B. L. S. No. 224.* Among many decisions on hours of labor and factory regulations etc., are to be noted the synopses of a case decided in Connecticut and one in Ohio courts upon occupational diseases in which compensation was not allowed because of the word construction of workmen's compensation acts in those states.

◆

Anthrax in California. *J. A. M. A.*, November 17, 1917, p. 1717. Eight human cases reported and the State Board of Health has issued warnings in regard to the handling of sick stock and the skinning of dead animals.

◆

Occupational Diseases in Massachusetts General Hospital. David L. Edsall, *U. S. B. L. S.*, December, 1917, pp. 169–185. An extension of the method of inquiry in the Massachusetts General Hospital into the extent of diseases purely or partly occupational was given one year's trial, before the war caused a discontinuation. During this time from 20 to 30 or more patients per day were sent to the industrial clinic (a rate of more than 5,000 cases a year) from the hundreds admitted each day. To get a line on the possible industrial affliction of applicants, a social worker, trained to some extent in industrial health hazards, interviewed each one immediately after his or her admission to the institution. The social worker had before her two lists, the first indicating the kind of patients that must always be referred to this clinic, and the second, a list from which some are sent according to whether inquiry brought out certain conditions. Reproductions of the blank forms used, an interesting list of exposures found, a large table of industries and trade processes in which lead poisoning occurred, and copies of educational leaflets, are all given in the article. The author takes exception to a remark of Prof. Willard Fisher that industrial diseases are not very common and produces records to show that they are not, in the least, uncommon. He advocates trained medical men, as they have in England, to give decided opinions in these matters and maintains that training in industrial diseases is as necessary as training in surgery. As an ultimate solution of the compensation aspect of these cases he is of the opinion that something which spreads out all over the industry and is aided by the state, such as health insurance, is needed.

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An Industrial Clinic. Wade Wright, *U. S. B. of L. S.*, December, 1917, pp. 185–193. Dr. Wade Wright, head of the industrial clinic of the Massachusetts General Hospital, till the war forced its discontinuance through lack of staff, discusses 5,121 cases received into that clinic during the year March, 1916, to March, 1917. The principal innovation was the selection of patients upon the basis of industry or trade process without relation to the particular ailment or complaint presented. With the aid of social and factory inquiry an immense amount of corroborative industrial influences were found in their afflictions. Several tables show the principal disease conditions found among various groups of workers and the table showing the distribution of lead poisoning by trade processes and industries of 148 positive cases is truly surprising. Doctor Wright then discusses the symptoms of lead poisoning in particular, chief among which are low abdominal pain associated with constipation, weakness of one or both wrists, pain in the lower lumbar and sacro-illiac regions, a lead line observed in 78 cases, especially by everting a tab of gum-margin, pain in the external condyle of the humerus, the blood findings, and the result of 238 analyses for lead in urine and stools, of which 97 were positive. There was but one instance where lead was found in urine but not in stools, but the opposite condition was frequently found. (The reviewer would point out that lead in either urine or stools does not in itself mean lead poisoning—*i. e.*, toxic symptoms must also be present—since the patient may be eliminating enough of the lead to prevent its concentration in the body in toxic amounts. E. R. H.) The industrial clinic undertook the treatment only of lead poisoned persons, an important part of which was personal instructions in avoiding future poisoning.

Public Health Laboratory Notes.

Abstracts by Dr. Arthur Lederer.

APPARATUS AND TECHNIQUE.

On the Development of a Method for Early Diagnosis of Tuberculosis by the Use of the Ex-Rayed Guinea Pig.—Experiments indicate that it is possible, by means of the x-Ray to increase the susceptibility of guinea pigs to tuberculosis. Frequently repeated doses have a more certain effect than a single dose. The removal of an nodule from the groin for examination can be done in about two weeks and is usually diagnostic.—W. H. Eckford, *Jour. Lab. and Clin. Med.*, *3*, *175*.

An Improved Modification of the Durham Fermentation Tube.—The small inner tube is inverted over a wooden rod so that it is lifted some distance from the bottom of the test tube, allowing free circulation of the medium in and out of the inverted tube. This arrangement has the advantage that shaking is more thoroughly accomplished since the impact of the inverted tube with the wooden rod causes a sort of churning movement which draws in and expels the medium. Raising the mouth of the inverted tube causes a certain amount of gas which is formed between the mouth of the inverted tube and the bottom of the large tube to be caught. This modified procedure of employing Durham fermentation tube is being carried on successfully in the Richmond Health Department.—K. D. Graves, *Jour. Am. Med. Assn., 69, 2102 (1917).*

⁂

Aids to Laboratory Efficiency.—Description of a number of methods and pieces of apparatus which facilitate chemical laboratory work. The author discusses his method of routine staining, the installation of siphon delivery bottles for common reagents, and arrangement for keeping glass rods and pipettes instantly available, a home-made hanging-drop slide procedure etc.—Miles J. Breuer, *Jour. Lab. and Clin. Med., 3, 241 (1918).*

⁂

The Bruck Precipitation Test for Syphilis.—Bruck, the corroborator of Wassermann on the complement fixation test has recently brought out a precipitation test for which he claims specificity. The test was reported in the last issue of the American Journal Public Health. A. W. Stillians performed a new test under the conditions prescribed by Bruck in 209 cases. He found that the test failed in a considerable percentage of early secondary syphilis. A positive reaction was obtained in from 24 to 28 per cent of nonsyphilitics. *Jour. Am. Med. Assn., Dec. 15, 1917, p. 2016.*

A Useful, Flameless, Transportable Incubator for use in the Field.—The apparatus consists essentially of a double-walled, metal chamber covered on the outside with good insulating material, as paper and felt. The space between the walls is filled with water at 50 C. After one hour the temperature in the chamber is 41 C., and after twelve hours it is 32 C. By changing the water twice in twenty-four hours, the apparatus can be used as an incubator, but its chief use is to transport sensitive research material in the field.—Erich Hesse, *Deutsch. Med. Wchnschr, 42, 979; Chem. Zentralbl, II, 627 (1916); Chem. Abstr. 12, 45 (1918).*

⁂

The Mechanism and Significance of the Gum Mastic Test.—In 1915, Emanuel (*Berl. klin. Wchnschr.* 1915, 52, 781; *Jour. Am. Med. Assn.,* Sept. 4, 1915, p. 908) announced a new colloidal reaction in syphilis. He used gum mastic, a reagent which was very easily prepared. Of thirty tests made on psychiatric patients, there occurred complete precipitation in all the tubes in fourteen syphilitic cases. S. L. Immerman found on using Cutting's modified technique that the amount of precipitation in the gum mastic reaction depends on the quantity of globulin present in the spinal fluid tested. The maximum precipitation is obtained with an optimum amount of globulin. Immerman also concludes that the reaction does not determine whether the fluid is syphilitic or nonsyphilitic. The test is not equivalent to or supplementary to the colloidal gold reaction.—*Jour. Am. Med. Assn., Dec. 15, 1917, p. 2030.*

BACTERIOLOGY AND PATHOLOGY.

Wassermann and Luetin Reactions in Tuberculosis.—Seventy-nine of a total of 170 negative Wassermann cases gave a positive luetin reaction, while only 18 out of a total of 28 positive Wassermann cases gave a positive reaction, justifying the conclusion that a luetin reaction cannot be used as a test for syphilis in a tuberculosis sanatorium to displace the Wassermann test.—H. J. Corper, W. A. Gekler, H. C. Sweany, *Am. Review of Tuberculosis, 1, 544 (1917); Jour. Am. Med. Assn., 69, 2147 (1917).*

⁂

The Schick Test with Especial Reference to the Negro.—The purpose of this study was to determine what color changes occur on very dark or black skins and the degree of natural immunity to diphtheria that negroes possess. In practically all cases tested in negroes there was produced a pigmentation darker in color than the skin. The reaction was equally as clear-cut as it is in whites. A study of 210 cases indicates that adult negroes possess about the same degree of immunity to diphtheria as do white adults.—Louis T. Wright, *Jour. Infect. Dis. 21, 265 (1917); Chem. Abstr. 12, 59 (1918).*

⁂

Rapid Method for Identification and Isolation of Meningococci from the Nasopharynx.—The method proposed employs a fluid medium which serves to eliminate other organisms resembling the meningococcus in about twelve hours and to reduce the full time required to identify the latter by at least one day. The medium consists of a 1 per cent glucose broth to which is added 5 per cent of unheated, sterile, clear, normal horse serum. One cc. of this medium is placed into tubes. Suspicious colonies on plate cultures are fished and seeded, a colony to each tube. These tubes are incubated for 12 hours. The meningococci grow in a characteristic manner. The fluid becomes faintly turbid, and a slight sediment forms. The sediment emulsifies uniformly when the tube is shaken. This observation eliminates at once a set of tubes. To the suspicious tubes is added 0.1 cc. of a 1 to 10 dilution of 0.85 per cent saline solution of a high-titre polyvalent anti-meningococcic serum. The tubes containing meningococci exhibit distinct agglutination. Those containing other organisms remain unchanged. The readings are checked by means of films stained by Gram's method.—Peter K. Olitsky, *Jour. Am. Med. Assn. 70, 198 (1918).*

⁂

Rapid Cultivation of Diphtheria Bacilli.—The method is based on the fact that the true diphtheria bacilli seem to be the only ones in their class that attack glucose and turn litmus red. Control tests in nearly a hundred cases have confirmed the prompt and reliable findings with this technique. The results were particularly satisfactory in the carriers whose scanty bacilli it was difficult to detect with other techniques. The culture medium is a mixture of 100 cc. horse serum, 10 cc. of a 30 per cent sterilized solution of glucose, 30 drops of concentrated and sterilized tincture of litmus and 3 cc. of 1 per cent solution of sulfuric acid. This mixture is distributed in Petri dishes. It is coagulated in the autoclave or with dry heat, very slowly raising the temperature to 75° or 80° C. and keeping this up for an hour and a quarter. The medium is blue with a slight greenish tinge, transparent, firm and elastic. It is inoculated with a triangular loop of platinum passed over the end of the cotton with which the throat has been swabbed. The loop is then dragged along the surface of the medium in parallel segments until all is smeared. The plates are then incubated at 37°C. In 24 hours the true diphtheria bacilli colonies show as transparent red pin heads. The false diphtheria bacilli do not attack glucose or modify the litmus tint. Staphylococci sometimes turn the medium red, but the aspect of the colonies is different and the microscope will settle their identity.—S. Costa, J. Troisier and J. Dauvergne, *Bull. de la Soc. Med. des Hôpitaux 41, 991 (1917); Jour. Am. Med. Assn. 70, 198 (1918).*

⁂

Determination of Types of Pneumococcus in Lobar Pneumonia.—A selected kernel of sputum about the size of a bean is washed, emulsified in broth, and inoculated directly into a centrifuge tube containing about 4 cc. of a special medium—glucose blood broth. After incubation in the water bath at 37 C. for five hours a blood agar plate is streaked with a loop full of culture fluid for the isolation of the pneumococcus in pure culture and the subsequent confirmation of type. The red blood cells are then removed from the culture medium by slow centrifugation. Three cc. of the supernatant bacterial suspension are pipetted into a second centrifuge tube containing about 1 cc. of sterile ox-bile and allowed to stand in the water bath at 37 C. until solution of the pneumococcus bodies has occurred, usually about twenty minutes. Five-tenths cc. portions of the bile solution of pneumococcus are used in precipitin reaction by mixing with an equal volume of immune serums. If bile is not available determination of the type of pneumococcus may be made directly on the bacterial suspension by macroscopic agglutination. The author recommends this method when an emergency is to be met. When mice are available he favors the use of the original method of inoculation. —O. T. Avery, *Jour. Am. Med. Assn., 70, 17 (1918).*

⁂

Isolation of Tubercle Bacilli from Milk.—The author isolated tubercle bacilli by Petroff's method from 64.8 per cent of the sputums which were found to be positive by direct microscopic method. The organism was recovered from 69.2 per cent of the samples of milk that were artificially infected. Of the milk obtained through the New Haven Health Department Laboratory 8.4 were found to contain tubercle bacilli. Stewart concludes that Petroff's method for the isolation of tubercle bacilli from sputum may be applied successfully to the examination of milk. With slight modifications the method should prove constant and reliable. The need of such a method for the examination of milk and milk products is apparent.—F. C. Stewart, *Jour. Exper. Med. Balti., 26, 755 (1917); Jour. Am. Med. Assn., 69, 2149 (1917).*

⁂

The Treasury Department Standard for Drinking Water; Its Value and Enforcement.—H. P. Letton concludes that the requirement of the standard regarding total count is very lenient (100 colonies per 1 cc. on agar at 37 C. after 24 hour incubation). It could be reduced more than half without eliminating any but an extremely small percentage of supplies that would otherwise pass the requirements. The limit of permissible B. coli content according to Letton is not too low (2 B. coli per 100 cc.), Sanitary surveys of the sources of supply are absolutely essential to correlate the bacteriological analyses. A very animated and illuminating discussion of the subject by leading sanitary engineers follows the original article.—*Jour. Am. Water Wks. Assoc., 4, 478 (1917).*

⁂

The Toxin of Bacillus Welchii.—The toxicogenic power of 10 strains of B. welchii has been tested with the result that all the strains have been found to produce toxin in greater or less degree. An antitoxin produced by the injection of toxin from a single strain is capable of neutralizing all of the toxins. This fact furnishes strong evidence of the common nature of the toxic products of the various strains.—Paul H. De-Kruif, Th. W. Adams, Paul M. Island, *Jour. Infect. Dis., 21, 580 (1917).*

⁂

Cultivation of Tubercle Bacilli from Blood.—M. C. Clough states that the occurrence of tubercle bacilli in the circulating blood at least in sufficient number to infect a guinea pig, is relatively infrequent (6.7 per cent) in all forms of tuberculosis other than miliary tuberculosis, whereas in miliary tuberculosis, tubercle bacilli occur in the blood in a large percentage (66.6 per cent) of cases. Tubercle bacilli have been grown in culture by Clough for the first time from the circulating blood of five patients with miliary tuberculosis. Blood cultures are suggested as an aid in the differential diagnosis of acute miliary tuberculosis from other nontuberculous infections, and as a means of studying bacillemia in all forms of tuberculous diseases. Direct cultures from spinal, pleural, peritoneal and other fluids are recommended in those cases in which tubercle bacilli cannot be demonstrated by smears.—*Am. Review of Tuberculosis (Balt.), 1, 598 (1917); Jour. Am. Med. Assn., 70, 125 (1918).*

⁂

Determination of Pneumococcus Types.—This test yields valuable and quick results. By its use the injection of a mouse or the use of a culture is unnecessary and Type 1 infections may usually be ascertained within an hour or two after the sputum is collected. The sputum is collected in a sterile container, 5 cc. of the sputum are pipetted into a small mortar. Relatively fine sand is added in sufficient quantities to make a rather stiff mixture. To the ground mixture 10 cc. of saline solution are added. The sand is allowed to settle and the supernatant liquid is pipetted off into a clean centrifuge tube. Ten cc. of saline solution are now added to the sand in the mortar. After mixing well, as before, the fluid is pipetted off into a second centrifuge tube. In this manner two solutions of the sputum are provided. The first more concentrated solution may be used for the immediate test, and the second less concentrated solution may be held for use in case of accident to the first solution. Both solutions are centrifugalized at high speed long enough to completely clear the fluid. The sputum in solution is brought in contact with the three types of antipneumococci serums 1 cc. of the former to 0.2 cc. of the latter. Often the first evidence of a positive reaction is seen a few minutes after the mixing of the serum and the sputum solution. The mixture is slightly opalescent fluid with a faint smoky "whirl" on shaking. The disappearance of the "whirl" seems to be the first phenomenon of specific reaction. Then, on warming in the water bath for a few minutes, a very slight feathery precipitate may be seen with the naked eye on close examination. As the tubes are left at rest in the water bath, the feathery flakes drift to the bottom of the tube and collect in a typical white mass. In a negative test there is no reaction of any kind and very little sedimentation.—O. W. H. Mitchell and W. E. Muns, *Jour. Med. Research (Boston) 37, 339 (1917); Jour. Am. Med. Assn., 70, 128 (1917).*

CHEMISTRY.

Estimation of Organic Carbon in Water.—An account of a modification of the Carrasco-Plancher method for estimating organic carbon in sewage and natural waters. It is recommended as both accurate and rapid.—Atilio A. Bado, Anal. Soc. Cuim. Argentina 5, 102 (1917); *Jour. Chem. Soc., 112, 541 (1917).*

Micro-Kjeldahl Methods.—A detailed description of the Kjeldahl methods applied to the estimation of nitrogen in small amounts of materials such as 0.5 cc. of urine or 10 mg. of an amino-acid.—Emil Abderhalden and Andor Fodor, *Ztschr. Physiol. Chem. 100, 190 (1917); Jour. Chem. Soc., 112, 540 (1917).*

Public Health Clippings.

Prepared by R. R. Harkness.

FRENCH ANTI-MOSQUITO CARTOONS.

Professor S. M. Gunn, Associate Director of the Tuberculosis Commission to France, has kindly sent us some French Anti-Mosquito cartoons which are reproduced herewith. We take pleasure in acknowledging the courtesy of Prof. Gunn.—Editor.

POUR REVENIR EN BONNE SANTÉ:

Ce sont certains Moustiques qui inoculent par leur piqûre le microbe du Paludisme.
Au Moustique oppose la barrière de ta moustiquaire.
Au Microbe oppose la quinine.

Translation.

To Return in Good Health:

There are certain mosquitoes which by their sting infect with the microbe of malaria.
Fight the mosquito with your mosquito net.
Fight the microbe with quinine.

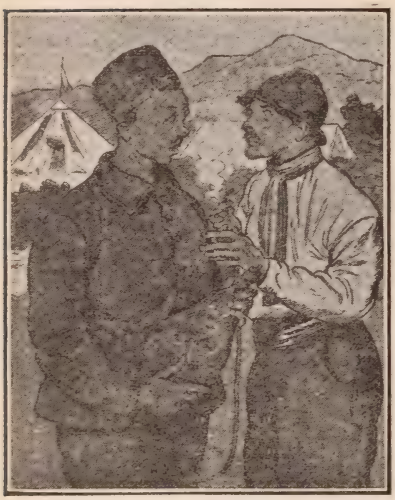
◆

Care for your baby,
Whatever you do;
In old age you'll want him
To care for you.

Shakespeare was one of the early advocates of fresh air treatment, for he says in Henry IV: "Give him air and he'll get well."

FRENCH MOSQUITO PICTURE PUZZLES.

Qui cherche, trouve.



—Mon vieux Bernard, pendant que tu es allé chercher du pinard, le sergent t'a flanqué quatre jours!

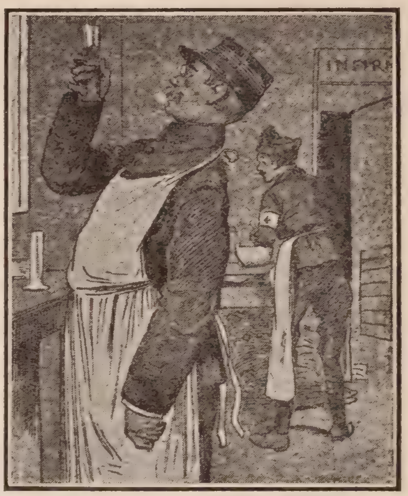
—A cause? — A cause que t'as pas installé ta moustiquaire et pas pris ta quinine. — Mais le toubib n'a rien vu!

—Erreur, le toubib sait tout et voit tout. Tiens, en ce moment, tu ne le vois pas, et il n'est pourtant pas loin. (*Cherchez-le.*)

"Bernard old man, while you were looking for some *pinard** the sergeant handed you four days!"

"For what reason?" — "Because you did not put up your *moustiquaire*† and did not take your quinine." — "But the *toubib*‡ did not see anything!"

"You are wrong, the *toubib* knows everything and sees everything. Why, at this moment you do not see him, but he is not far off." (*Find him.*)



—Infirmier!

—Major!

—Vous me donnerez le nom du matricule 2743. C'est un fricoteur! En analysant ses urines, je vois qu'il ne prend pas sa quinine et qu'il ne prend aucune des précautions prescrites contre les moustiques. (*Cherchez le fricoteur.*)

"Orderly!"

"Major!"

"You will give me the name of register number 2,743. He is a rascal! In analyzing his urine I see that he does not take his quinine and does not observe any of the prescribed precautions against mosquitoes." (*Find the rascal.*)

S. S. d'État du Service de Santé M. P. A. O.—
No. 13.

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*Possibly military slang. Our French dictionary does not give this term.

†A protective covering used at night made of mosquito netting.

‡An officer.

The Last Fly.—'Tis the last fly of summer, left buzzing alone; all her many companions have perished or flown. No more do we find them embalmed in our hash; no more are we threatened with typhus or rash.

The bald-head can now risk exposing his pate, assured that no insect will over it skate; Old Dobbin and Bossy, who all summer long beat time to the chorus of threatening song, now stand in the sunshine of gladdening vales, relaxing the muscles of overworked tails.

'Tis the last fly of summer that gladly anoints, with the warmth of our heater, its ossified joints, and shall we not spare her and pity her plight, and give her a bed and supper to-night?

Nay, let us arise, her existence to blot, and bring down the fly-bat with echoing swat, lest she will come back in the beautiful spring and forty-nine million of grandchildren bring. Albert Stroud.—*Bulletin of Kansas State Board of Health.*

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PRODUCTION AND CONSERVATION OF FOOD SUPPLIES.

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Department of the Interior, Ottawa.

Committee Report read before the Food and Drugs Section of the American Public Health Association, October 18, 1917, at Washington, D. C.

IT MAY be postulated that every human being has a right to as much food as his physiological requirements demand under what may be for him at any particular time a normal condition of existence. It may further be accepted, where many millions of men have been removed from productive employment as soldiers to defend the lives and welfare of the people of the nations for which they are fighting, that it becomes especially incumbent upon those who remain behind to see that the food requirements, as well as the other necessities of the fighting men are adequately supplied. It is plain that so far as the American continent is concerned the number of persons hitherto made non-producers by the war is insignificant compared with the 110,000,000 who occupy the United States and Canada; while inasmuch as these two countries are today allies it is proper and convenient that the problem of production and conservation of foods through the efforts of these two peoples be considered as one.

The problem contains three main factors: (a) enough of land utilized, (b) adequate cultivation employed, (c) careful conservation of food produced. It is difficult to determine whether or not these three factors are at present being adequately supplied, since we have absolute figures based upon only the census 1910–1911 to enable us to form an accurate estimate of the various products; while the amounts normally consumed at home are uncertain because of certain foods exported and of others imported. This question is further complicated by the absence of adequate knowledge of the relation between the number of producers since 1910 as compared with the increase of population and needs since then. The following figures will, however, add something to our knowledge on this important point. In 1910 there were in the United States 878,000,000 acres, or 46 per cent of the total land areas, in farms of which 478,000,000 were improved. This amount of acreage in farms was only 4.8 per cent more than in 1900; but the amount improved was 15 per cent; while the population increased from 75,994,575 to 91,972,200 in 1910 of which increase almost 12,000,000 was urban and 4,151,423 rural. Another remarkable fact is that in 25 metropolitan districts including cities of 200,000 or over, the areas included within ten miles of these cities' boundaries had a population of 20,000,000. In only a few states did the rural population increase; while in some of the most important agricultural states it actually decreased. Indeed in probably the most typical agricultural state with no large cities, Iowa, the total population actually decreased by 0.3 per cent; while of its towns of 2,500 or over there were 69 instead of 70 in 1910. Of its total population 2,224,000 in 1910 or 87 per cent of the whole were native born, of whose parents 58 per cent were native born. Of the total only 30 per cent lived in towns, while its rural population was 1,557,000 or more than in Illinois which had but 1,500,000 with a decrease of 111,000. The acreage in farms in Iowa decreased by 444,000 acres in a total of 34,374,000 which was 95 per cent of the whole state.

The three main cereal crops in these two states in 1912 were.

	Iowa	Illinois
Corn.............	432,000,000	426,000,000
Wheat...........	12,800,000	9,800,000
Oats.............	217,818,000	182,700,000

The importance of this decline of population in two central states may be judged from the fact that their total corn crops represented nearly one-third of the total corn crop of the whole United States. Dr. E. A. Taylor stated before the Committee of the House of Representatives in May last that the wheat acreage in 1916 was 57,000,000 bushels or 2 per cent more than in 1910 and that the corn crop was 2,500,000,000 bushels and not as much as in 1912.

Turning to Canada we find similar conditions existing as regards rural increase, since while the 1911 census showed a total population increase of 34 per cent there was an increase in urban populations of 62.5 per cent and only 17.5 per cent in rural. This disproportion enormously affected what should have been a normal increase in production, since it resulted in a decreased or almost stationary production in the older eastern provinces; while except in the matter of wheat production there was in many items practically a statical condition as regards farm animals in the provinces of the west. This lack of normal increase of farm products in the older provinces showed itself especially in the number of milch cows and in milk production.

In the important item of fish production Canada showed a moderate increase during the last census period; but this was wholly disproportionate to the increase of the consuming population.

This statistical review of the production of foods in America serves to make it abundantly plain that not only is the world slowly but surely approaching what Sir William Crookes in 1898 called in his presidential address before the British Association for Advancement of Science a "chronic world wheat famine," but also that in the several most important classes of food supplies of this continent the amount being produced annually, in proportion to the consuming population, has been decreasing since 1900. The monthly and yearly bulletins of statistical bureaus abundantly illustrate this in the steady rise of prices; while for Canadians it is important to note that taking 100 as standard the grouped cost of foods rose between 1900 to 1913 from 100 to 127.7 as compared with 100 to 119 in the United States. On this continent as elsewhere the immediate first cause of this is the increase in the urban populations whose correlative is a relatively less acreage under cultivation with farm labor less in amount, with an increasing cost of wages during the same period of 50 per cent, being an advance greater than in other great industries.

From what has just been stated it is apparent that the second factor in the problem, that of adequate cultivation is directly ancillary to that of the acreage and the relative amount of available labor. Dr. E. A. Taylor before the Congressional Committee last May pointed out that the food problem contains four distinct elements: (a) means to stimulate production, (b) means to lessen cost of production, (c) simplifying the machinery of distribution, (d) conserving foods to the limit of men's physiological needs. We have already pointed how even during the past three years in neither country have any adequate means to stimulate production been even measurably successful, since the second element of decreased cost of production has not existed. It can further be stated that the third element, that of simplifying the machinery or cost of distribution, has similarly been lacking and that the existence of too many middlemen and of millions living in towns not engaged in production or in any occupation serving the economic needs of the people is only now being discovered—not to say being dealt with.

As regards the fourth element that of conserving the food produced by preventing waste, it may be said that while it has been most enthusiastically championed by our food controllers, yet with the soaring prices of foods it has scarcely needed a propaganda as serious as it has received. It has, however, served the purpose of teaching the masses of the people that the cost of foods has very little to do in many instances with their nutritive values. We know how judicious advertising has in many instances established the popularity of goods, wholly apart from their values; while in other cases the result has been to make the useful but less attractive article come to be appreciated at something like its real value. It only need be stated here that there are in the present war crisis some commercial activities so inopportune that they demand drastic action in the interest of the whole public, one of such may be given. We have seen how the number of milch cows in America is almost stationary; yet we find ice cream manufacturers to have been increasing by 25 per cent in number every year for the last ten years and their business in the same proportion. A recent report of a hearing at Washington on ice cream standards states that if the old standard of 14 per cent of butter fat could be reduced to a normal of 7 per cent there would be 75,000,000 more pounds of butter for further use; but which now is used in a confection designed primarily to lessen the internal temperature of the consumer on a hot day.

At present, however, the essential problem is one of increased production of all the foods essential to the needs of the people and their allies. Dr. E. A. Taylor, before the House Committee insisted, as did most other witnesses, that the problem of production is not at present so much scientific as economic. Illustrating by what he had witnessed during several months in Germany he pointed out that today in America the primary question was one of fixing a minimum price for wheat and other chief crops to the farmer if he was to be asked to increase production. Doctor Taylor in the Bulletin "Food Needs for 1918" indicates the acreage increase required if the estimated needs are to be supplied especially of wheat and also intimates what else is required. He says: "We need to conserve and increase our food production; we need to eliminate waste and we need to control distribution. This can be done . . . only by an Administrative force possessing ample powers to act in accordance with the information in their possession." Without attempting to analyze fully this important statement it may be said that it was stated before that committee that there were 2,000,000 boys in towns and cities in the United States whose energies were available for increased production, and that their nonemployment meant waste of energy. Doctor Taylor estimated that when war broke out even Germany was wasting 30 per cent of her food supply, while the Department of Agriculture has estimated the value of food waste in the United States at $700,000,000, which is more than the total cost of New York's annual food supply. What this means may be understood when New York's food cost in 1914 was carefully estimated to be about $600,000,000. Doctor Taylor states that by drying, at least one quarter of the vegetables grown in Germany are saved; while in cities of 40,000 and over reduction plants convert garbage into oils and cattle feed, the latter when fed producing 2,000,000 quarts of milk daily. When it is remembered that potatoes have at most 18 per cent of solids and that town garbage in America contains 7 per cent of fats and that in 1913 some 25 city reduction plants in the United States produced 60,000,000 gallons of oil, the full meaning of these wastages and savings can be appreciated.

It has been estimated that at least half of the apple crop in America in 1914 was allowed to decay in the orchards; while it has not been uncommon for fruit in the market to be allowed to waste rather than have the arbitrary price reduced. Similar enormous losses of the coarser fish have for years been reported from both seacoasts and the stocker's neglect to provide provender has seen in some winters thousands of cattle perish on the ranges. Foods used in the manufacture of malt liquors and alcohol can only be classed with other wastes, since while they illustrate most scientific methods they do not add materially to the nutrition of the people; while the wastage as food is estimated by Doctor Taylor to be in 1916 in the United States 52,000,000 bushels of barley, 8,000,000 bushels of corn, 1,500,000 bushels of rice for beer and 32,000,000 bushels corn, 3,100,000 bushels rye, 54,000,000 pounds of sugar and 152,000,000 gallons molasses used for distilled spirits.

Another form of waste of primary importance since it effects directly the whole problem not only of quality produced, but of the cost of production to the farmer is that of fertilizers. Professor Crookes pointed out that essentially every pound of American wheat carried with it a definite weight of nitrogen from the soil and that to the extent of hundreds of millions of pounds this nitrogen was carried to the sea as sewage. In a July number of the *Weekly News Letter* the Assistant Secretary of Agriculture, Carl Vrooman, refers to the waste of this valuable asset in the United States. He estimates that one-half of manure is lost and that this amounts to 1,200,000,000 pounds or half the country's wheat crop in 1916. Even in dairy regions with intensive farming this loss is estimated at 25 per cent. What this means may be understood when in 1913 the wheat crops on the poor sand soils of Germany amounted to 35 bushels to the acre and only 15 in the United States; the potato crop in Germany averaged 235 bushels and in the United States 90 bushels. Measured in another way Germany uses on her whole area, only three-fourths the area of Texas, as much fertilizer as is used in all the United States.

CONSERVATION OF FOOD.

Many more illustrations may be given showing how wasting the fertility of soil, which fertility in the truest sense means the conservation of foods, may be prevented, since every dollar spent in cultivating exhausted soils means waste of energy since the cost is almost the same and the crops relatively less. Assuming, however that production is satisfactory it is plain that the producer must not only know how to conserve foods, but must also have facilities for doing this and a guarantee that the labor involved therein will be adequately remunerated. How this conservation of foods may be carried out will be especially discussed in other papers presented in this symposium; but it is evident that apart from methods of handling and distributing foods the processes by which the nutritive values in them are conserved depend directly upon the prevention of organic changes through decomposition of their constituents. This is abundantly illustrated by the several reports and papers which follow this summary, such as (a) Cold Storage, its Capabilities and How to Best Utilize and Extend Them, (b) Problems of Canning Operations, (c) The Present Status of the Preservation of Food by Canning and Possibilities of Increase, (d) Conservation of Fish by Canning, (e) Fruit and Vegetable Dehydration from a Technical Standpoint, (f) Report on Milk Standards.

Reverting to the problems of the distribution and marketing of food products, which are set forth in the report of the committee on "Retail Distribution and Marketing of Foods" it becomes apparent that the question of production and marketing becomes one, since the capacity of a people for increasing production when their interests are adequately satisfied, whether from necessity, profit or patriotism, becomes very evident from the illustrations of what has been possible during the past year in vacant lot gardening and the growth of special farm crops.

Viewing the matter, however, from the standpoint of a normal increase of production from year to year in keeping with the food needs of the population and world markets it is very apparent that comprehensive methods must be adopted for conserving in their natural fresh state such foods as dairy products, milk, butter and cheese; eggs and poultry products as well as fresh meats, and also for holding for the necessary time small fruits after being picked. This can only be brought about by the installation of refrigerating processes in the local communities where the products are grown. Such must be supplemented by coöperative methods both in storage and in marketing.

Such difficulties associated with the lack of local means of preventing the loss of perishable foods, as seen in the illustrations given in various papers and reports before the Section, would further seem likely to be lessened in the future through local canneries and dehydrating plants. These methods will serve not alone in lessening the loss and increasing production by the saving of second class fruit, but will measurably prevent foods becoming in their season a glut in the market to the detriment both of the producer and the merchant.

While defective transportation methods have added to the difficulties of the food problem, yet the rapid construction of good state roads and the marvelous development of the uses of motor trucks will prove a further means of bringing together the producer and consumer with the elimination of unnecessary middlemen whose energy might much better be engaged in production.

Dr. Peter H. Bryce, *Chairman.*
Dr. William A. Taylor,
Prof. Curtis M. Hilliard,
Irvin S. Osborn,
Prof. Wilfrid Sadler.

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A CORRECTION.

In the January issue of this Journal appeared an article entitled "The Red Cross and the War," by Dr. W. H. Frost. This was an address delivered by Doctor Frost from notes at the Washington meeting. The published article was essentially a stenographic transcript which Doctor Frost was not privileged to revise, because owing to serious illness, neither transcript nor proof of his article came before him for revision.

The title of the article should have been "The American Red Cross as a Public Health Auxiliary."

By a strange cumulation of perversities, the article was credited on the magazine cover to Dr. J. W. Trask, for which error the editor must apologize.—Editor.

INFLUENCE OF HEAT ON GROWTH-PROMOTING PROPERTIES OF FOOD.

DR. E. V. McCOLLUM,
Johns Hopkins University, Baltimore, Md.

Read before the Food & Drugs Section, Washington, D. C., Oct. 18, 1917.

SINCE the war began, I have felt it my duty to take advantage of every opportunity to give to the public all the useful information which my associates and I have gained through our elaborate investigations in nutrition problems. The Food Administration has been active in pointing out the serious shortage of some of our staple foodstuffs, and the need of eliminating waste and of preserving perishable food products, such as fruits and vegetables, by canning and drying, and of replacing wheat in our diets to some extent by other less used grains. I have made a special effort to point out what constitutes a safe diet, and to make clear the danger of restricting the food supply in too great a degree to the cereal grains and their products.

There is one phase of nutrition concerning which great misunderstanding exists, and I wish to discuss this briefly in the light of the well-controlled experimental evidence bearing upon it. I refer to the popular belief that canned goods sterilized by heat, and heated foods in general, are of inferior quality as compared with unheated. We are, in this country, regularly cooking all foods derived from cereal grains, meats, eggs and fish, all tubers and roots, and most of the products of the garden, with the exception of those things which are used raw in salads. Among uncooked foods, only fruits and milk are regularly eaten, and these are the articles which do not find a prominent place in the diet of the city dwellers of limited means.

Many references could be cited in the semi-popular discussions of nutrition, which have appeared in the last five years, to statements regarding the ready destruction by heat of a class of substances usually designated as "vitamines." It has been generally accepted that beri-beri, scurvy, pellagra and rickets, and possibly one or two other diseases, result from the lack in the diet of one or another of these substances, still uncharacterized chemically. Recently Miss Simmonds, Mr. Pitz and I have made it practically certain that there are but two chemically unidentified dietary essentials, and that beri-beri is the only one of the so-called "deficiency diseases" listed above which is actually due to the lack of a specific chemical substance. We have shown that scurvy and pellagra, while due to faulty diet, are not deficiency diseases in the sense which Funk, Williams and others have employed this term.

Beri-beri is in reality due to a shortage in the diet of a chemically unknown substance which is soluble in water and in alcohol, and is found in all natural foods. It is absent, or nearly so, from the manufactured foods, polished rice, starch, the sugars and the fats of both animal and vegetable origin. This I have called water-soluble B.

There is a second dietary essential to which I have given the name fat-soluble A, which is found in certain animal fats, and in the leaves, but in small and inadequate amounts in most seeds and is absent from all fats and oils from vegetable sources.

The lack of this substance in the diet leads to failure of growth, emaciation and death. The most prominent symptom observed in animals suffering from this specific type of starvation is edema of the eyelids, inflammation of the cornea and ultimate blindness. Butter fat, egg fats, fats from the liver, kidney, etc., or an abundance of food derived from green leafy vegetables quickly relieves the trouble.

We have recently begun an extensive study of the effects of heat of various chemical reagents on these two substances and no extensive discussion of their properties would be warranted at the present time. In view of the urgent need for intensive efforts in canning and drying of fruits and vegetables as a food conservation measure, and the widespread belief that heating destroys the food elements which have been but recently appreciated, it seemed desirable to present at this time such experimental data as is available on this point.

The method of testing for the presence or absence of one or the other of these two dietary essentials is simple. When a young animal is fed a ration of purified protein (casein), carbohydrate (starch or dextrin) and a suitable inorganic salt mixture, it does not grow and will not long remain alive. When to this mixture a substance or substances containing the unidentified fat-soluble A and water-soluble B is added, growth and well-being result. The presence of either one without the other will not prevent prompt failure of the animal.

To test for the unknown A we feed the purified food mixture described together with a small amount of some natural food rich in the factor water-soluble B, but free, or relatively poor in the factor fat-soluble A (*e. g.*, a seed or an alcoholic extract of some natural food), and to this we add the food to be tested for the fat-soluble A. If the latter is present in sufficient amount growth follows, otherwise failure supervenes. To test for the dietary factor, water-soluble B, the purified food mixture plus butter fat to furnish the factor A is fed with the addition of the substance to be tested.

As an example I may cite the following experiment, in which 25 per cent of navy beans supplied a sufficient amount of the water-soluble B to induce normal growth even after they were heated in an autoclave at 15 pounds pressure. The ration consisted of:

Casein, 18 per cent,
Dextrin, 48.3 per cent,
Butter fat, 5 per cent,
Cooked beans, 25 per cent,
A salt mixture, 3.7 per cent.

On this ration growth was approximately normal, and young were produced and successfully reared. Tho same ration with the beans replaced by carbohydrate permits speedy decline for lack of the unidentified dietary factor, which protects against polyneuritis, but the latter modification is again efficient in promoting growth when there is added to it an alcoholic extract of almost any natural foodstuff which supplies the missing dietary factor.

In other experiments we have fed peas and also wheat germ, which had been thoroughly cooked by heating in an autoclave at 15 pounds pressure for an hour, and have found that the growth-promoting properties of the peas had not been lost. This treatment subjects the foods to a temperature of between 112° and 115° Centigrade, and is a more severe heat treatment than is ever given to canned goods in processing.

The statement has been made that bread containing baking soda loses the dietary essential in question during baking.* This may well be true, for the experience of several investigators† indicate that extracts of rice polishings which possess marked curative powers when administered to polyneuritic pigeons, lose this property rapidly when they are made alkaline.

When cereals, fruits or vegetables are cooked with water, the reaction of the solution in contact with the food is, I believe, never alkaline. Destruction of the physiologically active substance concerned with the prevention and relief of polyneuritis is sufficiently stable in either neutral or slightly acid aqueous solutions to make its destruction by heat a relatively slow process.

Another factor which should be mentioned in this connection is the relative abundance of this dietary essential in most natural foodstuffs. We have not yet made an extensive study of the minimum amounts of the more important foods which serve to supply enough of these substances to support growth or maintain well-being in the adult. Numerous experiments have shown that for growth 3 per cent of wheat germ, 10 per cent of beans, 15 per cent of peas, have proven entirely satisfactory for supporting growth when the diet was otherwise of satisfactory quality, and derived its supply of the water-soluble B from such small amounts of natural foodstuff. It seems certain that any diet which contains as much as 30 to 35 per cent of one of the ordinary seeds, will be entirely adequate with respect to this dietary factor. When milk is contained in the diet even in small amounts as in the cooking of foods, the quantity of the water-soluble B, the substance which acts as a protection against beri-beri will ordinarily be present in very liberal amounts, and there is not, in my opinion, the slightest danger of a shortage of this substance in the diet.

Concerning the stability of the fat-soluble A at higher temperatures, we know that butter fat can be maintained for an hour or more at the temperature of boiling water without greatly deteriorating with respect to its peculiar growth promoting properties.

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* Voegtlin: Bread as Food, Bull. U. S. Public Health Service, 1916.

† Funk: Biochemical Bulletin, 1915, iv, 306.

Vedder and Williams: Philippine Jour. of Science, 1913, viii, 175.

Voegtlin and Sullivan: Jour. Biol. Chem., Proceedings Soc. Biol. Chem., 1916, xxiv, 16.

Leaf crops such as alfalfa are found by experiment to be still rich in this dietary essential after being cut and dried in the sun in the field. It is, therefore, a fairly stable substance under the ordinary conditions to which foods or feeding stuffs are subjected.

Pending the acquisition of exact data to show whether or not there is slow but progressive destruction of these two as yet unidentified food substances, we may feel confident that the danger of our running short of them as a result of our use of cooked and canned foods has been decidedly over emphasized.

There is actually a practical dietetic problem in so combining our available foods as to insure an adequate supply of the fat-soluble A, but none with respect to the water-soluble B in most parts of the world today. By far the greatest problems in dietetics today are involved in deciding how to group the natural foodstuffs so as to provide protein of high biological value, favorable inorganic content and adequate content of the fat-soluble A in the diet.

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Patent Medicine Exploitation in China.—"Dollars *versus* Health," is the title of an editorial in the September issue of the *Journal of the Outdoor Life*, which concerns the exploitation of China by the patent medicine interests, as advocated by the United States Department of Commerce in its special Consular Report No. 76.

At its annual meeting in May, the National Association for the Study and Prevention of Tuberculosis passed a resolution, a copy of which was sent to the secretary of the Department of Commerce, "urging that hereafter the influence of the United States Government should not be used in support of the patent medicine industry."

Mr. E. E. Pratt, the chief of the Bureau of Foreign and Domestic Commerce of the Department replied to the resolution, in effect, "that so long as a trade is legal the business interests connected with it are entitled to such services as the Bureau is in position to give them."

Mr. Pratt believes that the remedy for the situation lies in seeking legislation rather than in asking the Bureau to exercise authority not granted to it to discriminate between the manufacturers of different classes of products.

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Carbon Dioxide and Ventilation.—In an editorial in the *Boston Medical and Surgical Journal* for December 6, 1917, the question of efficient ventilation is considered. It has been shown that carbon dioxide is not an absolute index of efficiency in ventilation. No deleterious effects have been experienced even when the CO_2 content of the air has been increased from 6 or 8 parts in 10,000, to 300 parts. The CO_2 content of the air is only an index of the amount of respiration the air in a particular place has undergone. The important factor in heating and ventilation is not related to the chemical purity of the air, but rather to the physical effect upon the skin and mucous membranes. Their normal physiologic action must not be diminished. When the humidity of a room can be maintained between 40 and 45, the temperature between 60 and 65° F., and the air velocity between 1 and 3 feet per second, the carbon dioxide and organic contamination will take care of themselves.

The problem of ventilation is more serious during the summer months than the winter months. During the winter, the difference between indoor and outdoor temperatures is great, and air interchange takes place more readily.

It is the belief of the author that natural ventilation is being discarded because it is inadequate, out of place at the present time, and wasteful of fuel. (*M. P. H.*)

PRESENT STATUS OF THE PRESERVATION OF FOOD BY CANNING AND POSSIBILITIES OF INCREASE.

HENRY BURDEN,
President, National Canners Association, Washington, D. C.

Read before the Food and Drugs Section, American Public Health Association, October 19, 1917, at Washington, D. C.

THE food canning industry of the United States has never been so efficiently organized to produce a maximum of satisfactory and scientifically supervised product as at present. The aim of the industry during the past ten years has been to improve quality and the results of this policy are daily evidenced by increasing demand. Although production has increased from 4,000,000,000 cans in 1915 to an estimated requirement of twice that amount in 1918, consumption has more than kept pace in every item. The output of 1917 has been eagerly absorbed by wholesalers and the Government so that, even at this early date, there are practically no stocks of canned foods in the hands of canners. Probably a large factor in the expanding demand has been the rapid growth of urban population, but convenience and variety have done their part in popularizing cannery products in all parts of the country.

The organization of the National Canners Association in 1907 and the foundation of its Research Laboratories in 1913 have been important factors in the development of the industry. The members represent probably 70 per cent of all hermetically sealed and sterilized foods produced yearly in the United States, and the influence of their ideals is effective over the remaining 30 per cent.

The Research Laboratories, located in Washington at 18th and H Streets Northwest, have been invaluable in directing the work of Association members towards the improvement of product and in fostering a high standard of ideals.

When in June last the Government faced the problem of providing large quantities of canned foods for its projected training camps, it found the canning industry effectively mobilized and capable of supplying on an allotment basis 12 per cent of the entire pea pack of the country, 12 per cent of the corn pack, 18 per cent of the tomato pack, over 18 per cent of the refugee bean pack, and 8 per cent of the salmon pack. Without this coöperation it is doubtful if this quantity of canned food could have been acquired by the Government by the old method of advertising for proposals, and without an accompanying upheaval of markets. As it was, the Government purchased its canned food supplies at uniform and reasonable prices. Every transaction has been passed upon by the Accountancy Division either of the Department of Commerce or the Federal Trade Commission.

The Canned Milk Section of the National Canners Association has appeared almost in a class by itself in the remarkable service it has been able to render since May last, and in the unselfish and patriotic manner in which it has responded to the calls of the Army and Navy, the Commission for Relief in Belgium and the Red Cross. The demand for evaporated milk and sweetened condensed milk from the sources named has been simply stupendous. The burden of furnishing this great volume of canned milk has been distributed by voluntary consent over the entire industry on a *pro rata* basis at prices determined from month to month.

As to future expansion, this is limited only by the supply of tin plate available. The world stocks of this material are not sufficient to supply the demand, and distribution becomes a priority measure. The packing of baked beans had to be suspended for nearly three months in 1917 to permit of an accumulation of sufficient tins for the expected harvest of perishable crops. Had the crops of 1917 been really normal or even nearly so, the shortage of cans would have been very acute.

The usual cannery equipment is ample to care for a crop much larger than any that has yet been realized—a most fortunate consideration when we are daily receiving additional reminders that in the responsibility of feeding the world during the next year, the United States must play a leading part.

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Home Canned Food Safe.—The United States Department of Agriculture has issued the following statement prepared by the bacteriologists of its Bureau of Chemistry and the States Relations Service:

"There is no danger that the type of food poisoning known as 'botulism' will result from eating fruits or vegetables which have been canned by any of the methods recommended by the United States Department of Agriculture, provided such directions have been followed carefully. It is possible that in a number of instances the directions were not strictly followed and that spoilage has occurred. Of course, extreme care should be taken to ascertain before eating canned goods of any kind whether they are in good condition, and if they have spoiled they should not be consumed.

"In case of any doubt as to whether the contents of a particular can have spoiled, the safest plan is to throw it away, although all danger of botulism may be avoided by boiling the contents of the can for a few minutes, since the *Bacillus botulinus* and the toxin or poison which it produces are killed by such treatment. No canned food of any kind which shows any signs of spoilage should ever be eaten. In the cold pack method of canning given out by the Department of Agriculture, only fresh vegetables are recommended for canning, and sterilization is accomplished by the following processes: cleansing, blanching, cold dipping, packing in clean, hot jars, adding boiling water, sealing immediately, and then sterilizing the sealed jars at a minimum temperature of 212 degrees Fahrenheit for one to four hours, according to the character of the material. Since the spores of *B. botulinus* are killed by heating for one hour at 175 degrees Fahrenheit (according to Jordan's "Bacteriology" and other recognized textbooks) there is no reason to believe that the *botulinus* organism will survive such treatment."

MUNICIPAL FOOD DEPARTMENTS IN MODERN WAR.

OLE SALTHE,
Assistant Director, Bureau of Food and Drugs, Department of Health, City of New York.

THE principal difficulty in preparing a paper on this subject is that in most of the larger cities there is no municipal food department. As a general rule, such functions as relate to food control are distributed amongst several branches of the City Government. Most of the food work performed in the larger cities is carried on by the Health Department. In addition, there is generally a market department which supervises the municipal markets of the city and then there is usually a mayor's committee or commission which handles such food problems as do not come under the control of either of the aforementioned departments. Inasmuch as the functions of each of these departments are closely related to each other, and as a proper food control not only should insure a freedom from adulteration and fraud but should also take into consideration the economic features of a food supply, it seems that all the functions in connection with a municipal food control should come under the supervision of one department or commission. Inasmuch as practically all phases of food control have a direct relation to health, such department or commission should have the same broad, general powers with respect to food control as the health departments now have in matters of public health, especially such powers as are exercised by the Health Department of New York City. To more clearly emphasize this point, the present conditions in New York City, with respect to its milk supply, may be cited. With the increase in the price of milk there has been a gradual decrease in consumption and, during the past few months, there has been a marked increase in the death-rate of children due to diarrhœal diseases. While this increase in the death-rate cannot be definitely attributed to milk, nevertheless it is very significant. It would appear that, with the decrease in the consumption of milk, other foods have been substituted which have not the same food value as milk and are not as nourishing or as easily assimilated by infants as milk. Thus it will seem that, while it is important that a food supply must be safe and wholesome, it is also important that the supply of staple foods must be abundant and that the prices of same must not be prohibitive. These defects in organization are pointed out for the reason that it is rather difficult to establish an effective food control unless the proper machinery is supplied. Before leaving this thought, it might also be pointed out that, in addition to the overlapping of functions of the municipal departments, the state has generally two or three departments which exercise supervision over certain features of the food supply of a large city. For instance in the state of New York there are four different state departments and one state food commission which exercise supervision over certain phases of New York City's food supply. In addition to this the United States Government, through several departments, also exercises supervision over certain phases of the city's food supply. While it is necessary that both the United States Government and the state should exercise supervision over certain phases of the food supply, it is, nevertheless, a fact that some of the function performed by these departments, especially the departments of the state, are and can be just as effectively enforced by the municipality. There, therefor, is a great need for a thorough clarification of the functions of these authorities so as to eliminate all duplication of effort and have a clear understanding and agreement as to division of functions.

One of the first steps a municipal food department should take during the war would be to so arrange its organization that it could be ready to coöperate to the fullest extent with the United States Government, the United States Food Administration or such other governmental agencies as are charged with the supervision of the food supply. The municipal food departments should be ready to supply promptly such local information as might be requested by the aforesaid bodies.

During the progress of the war the municipal food department should continue to enforce its laws and regulations and there should be no relaxation of the rigid enforcement of same because it is just as important to maintain the same standards of quality and wholesomeness during the war as during peace and probably more important for the reason that certain unscrupulous food dealers might take advantage of the conditions in the trade and sell foods which were highly adulterated or grossly misrepresented or misbranded. It might be advisable, however, for the municipal food department to consider all its activities and eliminate such as have no direct relation to the food situation or are not founded on good reasoning.

The municipal food departments should take steps to procure accurate statistics concerning the amount and kinds of foodstuffs received in the city and the places where it is handled and stored and how much of the food supply is actually consumed in the city. This information would be especially valuable as a factor in determining how long a city could be self-sustaining without outside assistance. At present I believe that the absence of such information is a material hardship to every municipal food department. Most of the departments can give a fairly accurate statement as to the amount of foodstuffs received but have no figures as to the amount of foodstuffs that remain in the city or how much is consumed there. In New York City for instance the total receipts of food are tabulated by the Health Department, but it has been unable to obtain accurate figures as to the proportion of the food which actually remains in the city and is consumed there. Such information could only be obtained after considerable work and the department has not the facilities to accomplish this.

The next important feature and probably the one of paramount importance during the war is the duty of endeavoring to eliminate food waste. The first step taken by the municipal food department in this direction should be by organizing a system of inspection of its food supply as it is brought into the city. This could be accomplished by placing inspectors at the various receiving points. The food could then be examined not only as to its quality but also as to the conditions under which it is received and the manner in which it has been packed and transported. In instances where the foodstuffs show a percentage of decay or spoilage, the municipal food department could immediately order the overhauling and repacking of same so that the sound foodstuffs could be saved and further deterioration prevented. In such instances the municipal food departments should procure all the facts concerning the shipment of such foodstuffs from the time of packing at the point of production until its receipt. This would include a thorough examination of the foodstuffs in order to obtain, if possible, the condition in which it was packed. Observation should also be made as to the condition of the packages in which the foodstuffs were shipped, information as to the date of shipment, so as to determine if the foodstuffs were unnecessarily delayed in transit, and a thorough examination should be made of the railroad car to determine the ventilating and refrigerating facilities. With the information thus obtained, the food department should notify either the shipper or railroad as to the reason of spoilage, with a view of having same corrected in future. The municipal food department should also bring this to the attention of the Federal Department and to the attention of the state from which the foodstuffs had been shipped so that the state could coöperate with the shipper with a view towards improving the methods of packing and shipping. In New York City this has been tried out with the result that during the first eight months of this year over 2,000,000 pounds of unsound foodstuffs have been prevented monthly from being mixed with the commerce of the city. The majority of this food was sorted from sound food and failure to have taken this precaution would undoubtedly have resulted in a much greater loss by the time such foodstuffs reached the consumer. About one hundred shippers in twelve different states of the Union have been notified by the department as to the reasons for condemnation and causes of spoilage have been pointed out. Where the merchant refuses to overhaul foodstuffs which contained partly unsound and sound food, because of the fact that it would be a monetary loss for him to comply with this order on account of the prevailing labor conditions, the municipal food department should endeavor to save the sound portion of these foodstuffs. This might be done in several ways. In New York City for instance, during the past summer, a group of public-spirited and patriotic women organized a Canning Kitchen and, with the coöperation of the Health Department who made it possible for them to obtain these foodstuffs which had been abandoned and would have been sent to the dump, these women overhauled same with the assistance of Boy Scouts and under the supervision of inspectors of the Health Department and up to the present time they have rescued approximately 35,000 pounds of sound foodstuffs which otherwise would have been destroyed. Where the Canning Kitchen could not use some of these foodstuffs, on account of their limited facilities, these foods were sent to charitable institutions where they were overhauled by the inmates under the supervision of inspectors of the Health Department and the sound material rescued from the dump.

Another duty which the municipal food department should perform during the war should be the issuance of daily price reports which would give the retail prices of the various staple foods and would also give the price of perishable foods in season. This report should also give advance information as to the market conditions and when certain perishable foods would be abundant. This report could also be of educational value to the consumer in that it would give information as to the various foods which were abundant and cheap. This report should be published with the coöperation of the daily newspapers and should also be printed in all of the local newspapers, including those printed in foreign languages.

During the progress of the war, the department should be especially alert in eliminating food waste due to trade custom in handling food. As an instance of this, the experience of the Health Department in the inspection of beans might be cited. During the early part of this year a large quantity of Brazilian beans were placed upon the New York market at a time when there was an unusual demand for beans because they were recommended as substitutes for other foods which were particularly high in price. Upon inspection it was found that a percentage of these beans were buggy or fly-infested. Where the infestation did not exceed 5 per cent the beans were permitted to be sold. At the time a considerable quantity of these beans were placed in storage and upon recent inspection it was found that the majority of the beans were fly-infested. These beans are now being subjected to a process of fumigation, but if this process had been applied at the point of shipment little or no loss would have resulted.

A study of the various food industries in the city should also be made with a view of eliminating food waste. As an example as to what can be accomplished by such a study, an investigation of the methods employed in a large macaroni factory might be cited. In the manufacture of macaroni, there is a certain amount of waste in the trimming which is permitted to fall upon the floor and become trampled upon. This waste is gathered up at the end of the day, placed in barrels and eventually sold for chicken feed, and this particular factory averaged from twenty to thirty barrels of waste each month. With an arrangement so made as to catch such trimmings before they fall to the floor, there is no reason why same should not be utilized for human food.

The municipal food department should also advocate the use of substitutes for staple foods and should encourage the consumption of such products that could be used as human food but are not owing to some foolish prejudice. As an instance of this, might be cited the use of horse-flesh for human food. The Freibank system which is used in Germany should also be installed in the cities, and thousands of pounds of meats which are now being condemned and used for fertilizer could be properly sterilized so as to be rendered safe for human consumption.

A municipal food department should also study its market and terminal facilities and should promote and advocate the establishment of adequate terminal markets, so as to eliminate all unnecessary handling in transit.

The municipal food department should also be empowered, in cases of actual or anticipated emergency on account of shortage of necessaries, by reason of excessive charges or otherwise, to purchase food with municipal funds or on municipal credit. This food could be placed in storage and then sold to the inhabitants in such manner and through such agents as it may determine.

In conclusion I might state that there are other duties which the municipal food departments could perform during the progress of the war but the time does not permit me to elaborate further and I have endeavored to select what, in my opinion, appear to be of primary importance. There are two important features which I would like to stress particularly in this paper, namely the elimination of the duplication of effort in the enforcement of laws and the rigid adherence to a program in which the elimination of food waste is foremost.

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An Ode to Health.—Health of itself makes life a perpetual joy. Nothing daunts, nothing overawes, nothing discourages and nothing overpowers the man and woman possessed of health. Health means not only vigor and energy of body, but also clarity and strength of mind; purity and beauty of soul. The healthy person dominates life instead of allowing life to dominate him. He scarcely thinks of his body as consisting of parts or as performing separate functions. To him the body is but one harmonious whole. He is a unit, a being, a man; complete, vigorous, perfect. To such a man work is a joy. He regards obstacles as but opportunities for testing his strength. He hardly knows what weariness is. He never experiences exhaustion. Merely to grasp his hand is a pleasure. To gaze into his eyes is a joy. To hear his voice is to feel a thrill pass over one. To peer into his mind serves as a stimulus to higher achievement. Health supplies the courage, the aggressiveness in life. Without health one is bankrupt regardless of what his financial capital may be. He becomes a cipher in the world of real men and women. If you have health, then friends, cherish it, guard it and treasure it as you treasure life, for out of it are the issues of life.—*Monthly Bulletin, Indiana State Board of Health.*—From *Cincinnati Sanitary Bulletin.*

THE FISH CANNING INDUSTRY.

PROF. C. M. HILLIARD,
Simmons College, Boston, Mass.

Read before the Food and Drugs Section, October 18, 1917, at Washington, D. C.

ANY food commodity that is harvested in abundance beyond the normal demand during certain seasons of the year lends itself to preservation to tide over periods when nature is less opulent. Some varieties of fish show this seasonal fluctuation and thus the surplus should be treated or handled to obtain more equal distribution throughout the year.

There is an adage that "there are as good fish in the sea as ever were caught." This is probably true, and not only as regards the size of fish but also of kinds, as is testified by the recent introduction of the tile fish (1915), the gray fish (1916), and the tuna. The traditional prejudices are readily dissipated by wise propaganda. Though we accept the "hot dog" without a murmur, I doubt if the "dog fish" would ever find its way to our table without changing its name. There are other sea foods with objectionable names or looks which are equally palatable and will some day be found in our markets.

The food value of fish is very great, and in most cases, the flesh is readily digestible. The fat content is the most variable constituent and it is convenient to classify fish on the basis of the fat content. (Hutchinson.)

A. 5 per cent and more as in salmon, eel, herring.

B. 2–5 per cent as in halibut, mackerel, mullet.

C. Less than 2 per cent as in cod, haddock, whiting.

The composition of a few of the commoner food fish is shown in the table below.

There is a large amount of waste in fish in the bones, head, skin, etc. This has considerable commercial value and may be used for fertilizer, feed scraps for hens and cattle, or for glue, soap and oil. Small or otherwise useless fish may be used for similar purposes and it is interesting to note that investments in such rendering plants amount to between three and four million dollars.

According to the United States census reports, the canning of fish has

	Water	Proteid	Fat	Ash	Fuel value in calories per lb.
Cod..............	82.6	16.5	0.4	1.2	325
Halibut...........	81.7	17.2	5.2	1.0	565
Mackerel..........	73.4	18.7	7.1	1.2	645
Salmon............	64.6	22.0	12.8	1.4	950
Herring...........	72.5	19.5	7.1	1.5	660

not seen an extensive growth in this country of late. In the decade from 1899 to 1909 it showed the smallest per cent increase of any of the canned products (40 per cent). In 1909 the total output of canned fish was valued at $25,514,000; in 1914 at $18,585,825. Canned oysters in 1909 had a total value of $2,813,000, and in 1914 $3,815,000. The following table gives the amounts of certain fish canned in 1909 in the United States:

Salmon	99,813,713 lbs.
Sardines	90,694,284 lbs.
Oysters	28,192,392 lbs.
All others	16,700,000 lbs.

Fish artificially preserved in other ways in 1909 were as follows:

SMOKED	
Salmon	6,836,099
Herring	21,369,858
All others	12,609,032
SALTED	
Cod	54,302,388
Herring	21,718,467
All others	52,518,444

The Pacific coast is the chief source of salmon, while in New England, Maine supplies almost all of the sardines and Massachusetts supplies one-half the smoked herring, 78 per cent of the salt cod and 96.6 per cent of the salt mackerel. Alaska has recently developed her salmon fisheries so that the output of the canned salmon alone is equal in value to all the fish canned in the United States. In 1915 they supplied 4,500,000 cases valued at $18,653,000.

Shellfish are popular with the American people, and it seems appropriate to mention a small industry of considerable potentialities. I refer to the harvesting of the common sea mussel, Mytilus Edulis. Its food value is high; the flesh is tasty and easily digested, and it is readily canned without impairment of flavor or nutritive value. It has been adopted as a food in other countries including France, England, Russia and Spain. It further lends itself to cultivation and harvesting more readily than the clam or oysters. This shellfish has all the merits to make it an important canned food product if it is vigorously popularized through the Government and other agencies.

With increased transportation facilities and refrigeration the zone for successful distribution of fresh fish is greatly increased. Abnormal catches on certain days can be readily handled and conserved in this way, but the seasonal and more perishable fishes are more safely and normally conserved by canning. This, too, is the only mode in which fish can reach our soldiers in Europe. Besides, the canned product reaches the rural market where the fresh or chilled product cannot. The mail order business has, and will in the future enrich the diet of the rural dweller by placing a wider variety of canned commodities at his disposal. Canned fish from Gloucester has been served to a New Englander in South Carolina recently.

The apprehension regarding food poisoning from canned fish products especially, lobsters and crabs, is probably a superstition. There are but few authentic records of any outbreaks of food poisoning traced to this source. In a recent compilation on outbreaks of Botulinus by Dickson, no mention was made of fish. Two small outbreaks were attributed to bottled clam broth.

Apart from the preservation of fish as food, it is worth noting that many of the Atlantic coast fisheries are fast declining on account of over-fishing or abnormal conditions arising from increased population, and from industries. In examining the 1916 Report of the Commissioner of Fisheries and Game in Massachusetts, and making certain comparisons of that year with the year 1895, the striking decline in the amount of alewives, sea herring, menhaden and lobsters is noted. The causes for this decline are numerous and this is not the place to enter into a discussion of them. But it is commendable that the state, and the United States Bureau of Fisheries are earnestly studying these matters in relation to their correction. The Bureau of Fisheries in 1912 distributed no less than 3,688,000,000 fish eggs, fry, fingerings, and yearlings. The Massachusetts Commissioner has made an intensive study of the situation in relation to the alewife fisheries, an important work, to standardize the laws in regard to the fisheries on the shore towns, introducing uniform methods of sale and catch, rigid inspection to prevent illegal pollution, obstruction, and over-fishing. Similar work in other branches of the fish industry will revive some hitherto important industries and may even bring about entirely new sources of food and wealth.

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Hygiene for Students in Canadian Universities.—J. G. Fitzgerald, in the *Public Health Journal* for November, 1917, urges that the students in the Canadian universities be taught the elements of hygiene, and that each school should have more advanced courses in public health and sanitation for students who are particularly interested. Furthermore, it is suggested that every student should be medically examined before being admitted to the school, not only physically, but also to determine whether he is a typhoid or diphtheria carrier. By charging each student a small annual fee, a system of free medical service could be introduced at each university.

Milk Control in New York Cities.—According to the *Municipal Journal* for November 15, 1917, out of 26 cities investigated by the State Bureau of Information of the State Conference of Mayors, only five or six make no attempt to ascertain what kind of milk is sold within their limits. These places are Oswego, Hudson, Johnstown, Kingston and Plattsburg. All the larger and more progressive cities of the state do protect their supplies either separately or by coöperation through bacteriological control. The salaries for the bacteriologists range from $750 to $2,000 per annum, the mode being about $1,200.

FRUIT AND VEGETABLE DEHYDRATION FROM A TECHNICAL STANDPOINT.

Clarence V. Ekroth,
Chemist, Bureau of Foods and Drugs, Department of Health, New York City.

(Work done in coöperation with The Mrs. Oliver Harriman Food Research Laboratory of New York.)

Read before Foods and Drugs Section, October 19, 1917, at Washington, D. C.

NOT only is the dehydration of fruits and vegetables of interest as a measure of wartime economy, as well as a solution of our normal food waste problems; but, as many have pointed out, it is of prime importance as a factor in helping to bring down the ever mounting cost of living.

Of the thousands of questions put to the writer there is none more frequent than the query: "What constitutes the difference between dehydrated and evaporated food?" My answer to this would be as follows:

Dehydrated apples, for example, would contain practically no moisture. They would have, when prepared, a taste and appearance so closely resembling the fresh fruit as to make their detection practically impossible. Furthermore they would not be sulphured or treated with any objectionable preservative. On the other hand, an "evaporated" apple, by virtue of its fumigation with sulfur dioxid can safely retain part of its original moisture without decomposing in any manner. It would also have the taste which is so characteristic to us all and which is easily discernible in the dish when prepared.

Dehydration would thus, as the writer sees it, be definable as the process of removing all of the moisture from fruits and vegetables in such a manner as to leave the other properties such as flavor and texture almost wholly intact.

There are two general methods of removing moisture, namely, by natural and by artificial means.

The former involves the employment of the natural factors, air and sun, and the latter resolves itself into two subdivisions, to wit, drying with vacuum and with draft.

The writer has given only passing consideration to sun and air drying as the workers who have tried it out thoroughly prove its impracticability from an economic standpoint, except in very dry climates. When we stop to consider that the time required to dry by air is spoken of in terms of weeks rather than days, and, on the other hand, drying by mechanical means can be accomplished in a few hours, the relative economy of the two from the point of view of time alone is apparent. Besides in any slow process of drying some form of preservative is usually required in order to prevent decomposition from taking place before the drying would be completed.

Vacuum drying has a distinct and well defined place in technical operations, namely the concentration of fluid substances, as well as the separation of such principles as would suffer a change of composition or of physical state at higher temperatures; and wherever great rapidity of evaporation at lower temperature is called for. For other purposes it is rather expensive, hence its use is recommended only where other methods fail.

This brings us to the most important group, namely the drying with draft. In this class there are two methods: (a) that using either flue draft or forced draft, and (b) the employment of heat or using air at ordinary temperatures.

There are at least two objections to dehydrating at ordinary temperatures: one is the length of time required, and, secondly, the agencies of decomposition in the form of various microörganisms and enzyms are not destroyed but remain, causing a gradual change in the properties of the food product.

The moisture usually retained when drying at ordinary temperatures, even if present only in small amount, greatly accelerates these changes, as does also storage in warm places. Steaming or "blanching" the food before drying would destroy enzymic activity, but unless the material so dried is finally sterilized after drying and placed in sterile containers the action of the microörganisms would still have to be reckoned with. When we take into account that air at ordinary temperature, say 70° Fahrenheit, has a moisture capacity of but 1.3 per cent of its own weight while air at 90°, 140° and 170° can hold approximately 3, 10 and 25 per cent respectively of its weight of water vapor, we can see at a glance why even a slight increase of the temperature so noticeably reduces the time factor. As for making his choice between the two methods afforded by flues or by fans for securing the necessary circulation of air, the writer has still to be convinced that the economy afforded in using a fan blower operated at high mechanical efficiency is not to be preferred over flue draft, which, as we all know, is secured by taking advantage of the principle that hot air, being lighter in weight, will rise and in rushing upward through the chimney flue will draw in and be displaced by fresh air which is usually admitted at the bottom of the kiln. In this frequent displacement of the air, which in some industrial drying operations is affected more than six hundred times per hour, there is wasted a very large quantity of heat contained in the air which is not given the proper opportunity to carry away even a substantial part of its capacity of moisture. We may add to this the consideration that moist air produces the very best results in dehydrating, not only in saving of time but also in securing an even and thorough drying, since the moisture-laden air keeps the outer layers of the vegetable cells soft and permeable and so permits the easy escape of the internal moisture. Warm, dry air, on the other hand, hardens the surface and retards the process, while a much higher heat will be required to remove the moisture within, leaving a product inferior in both taste and appearance, and often incompletely dehydrated.

The writer has secured some very encouraging results in this way with some thirty odd vegetables and fruits and is having constructed a modest sized apparatus with a daily capacity of about 1,000 pounds with which to continue his experiments on a practical scale. The dehydrator used in this work consists of a heater, a fan and a kiln, all connected by flues with each other. The kiln is built on the compartment principle, and, after cutting and preparing, the material is placed on wire cloth trays therein. Warm, moist air is recirculated about the material and all conditions such as temperature, moisture and air flow are adjustable and in control of the operator. The temperatures employed range from 100° to 170° Fahrenheit. The time of dehydration varies from two to five hours depending upon the product, the former for greens and leaves, the latter for tubers and roots. There is contained from 70 to 95 per cent of water in the vegetables and fruits, all of which is removed by the dehydration process. A considerable shrinkage of bulk takes place, and by further compression mechanically into cakes or blocks, a saving of more than eight tenths of the original bulk is obtained. The average reduction of weight is about the same, as the waste is removed in the preparation before drying.

When reconstituted, the dehydrated product again assumes the general appearance and flavor of the fresh material and microscopic examination shows that the cellular structure is not destroyed by the process. As the materials either in preparation or during dehydration are never subjected to a temperature of more than 212° Fahrenheit, it is evident that the food value is not affected by dehydration any more than by ordinary cooking—if at all. The material is reconstituted or rehydrated by allowing it to take up water; cold, lukewarm or boiling, depending on the material; and is then ready for cooking.

In this connection it is of interest that Mrs. Oliver Harriman has had the dehydrated products served in her home in New York, and that this entire research has been made possible by Mrs. Harriman's patriotic interest, demonstrated by the joining of forces of the Food Research Laboratory bearing her name with those of our Bureau of Foods and Drugs.

The process, when worked on an industrial scale is low in cost and the enormous economy and advantage over other forms of conservation is readily seen—for example, the saving of freight and storage charges, cans and jars, sugar used in preserving and elimination of losses by freezing and decay.

As the dehydrated products are hygroscopic they will take up moisture, unless kept in moisture proof packages. Waxed paper bags, waxed cardboard boxes or cans may be employed, depending upon the handling to which the material will be subjected in transportation.

Had we been prepared to dehydrate this year, the many thousands of car loads of fruits and vegetables now lost would have been conserved for use later on, to help offset the great shortage of crops prevailing over the whole world.

RETAIL DISTRIBUTION AND MARKETING.

MARION TALBOT,
Professor of Household Administration, University of Chicago, Chicago, Ill.

Committee Report presented before the Food and Drugs Section, American Public Health Association, October 19, 1917, at Washington, D. C.

YOUR Committee, in the brief time at its disposal, has not undertaken to carry out a very extensive program. We have adopted as our leading principle this thesis, viz.: the elimination of every kind of waste in the distribution and marketing of food supplies must be enforced as a war measure if the nation is not to suffer unduly in physical vigor and in the power to work out ideals of democracy. We would point out first that many kinds of waste result in an increased cost of food, and the relation between the cost of food and the public health is apparent from many points of view. For example, from investigations conducted during the past twenty-five years it has become evident:

a. That large numbers of our male citizens, estimated a few years ago at five million, receive from their earnings annual incomes of less than $650.

b. That where the income is between $700 and $1,200, from 40 to 50 per cent of the income must be expended for food, even at the scale of prices that prevailed a number of years ago.

c. That during the past few years, the prices of food have risen far more rapidly than the earning capacity of large numbers among the wage-earning group.

d. That there is a direct connection between the earning capacity of the father and the rate of infant mortality.* And the earning capacity of the father is measured not merely by the wage-level, but also by the prevailing level of prices of those commodities which constitute an essential element in his budget, such as the foods eaten by the lower wage-earning group.

e. That a large proportion of school children are undernourished and suffer from many diseases due to malnutrition.

If there are to be discovered then, in the methods of distribution of the food supply, elements of waste which can be done away with so as to reduce the cost, such eliminations will bear directly on the public health. Your Committee is indebted to Dr. S. P. Breckinridge of the University of Chicago for the formulation of some of these elements of waste.

1. Lack of organization of the supply with reference to the distance between the place of production and the place of use, viz., the needlessly long haul and duplications of haul. Professor Clyde L. King has shown ("Lower Living Costs in Cities") that this lack of organization involves not only unnecessary deterioration in the quality of the food, but a wasteful hauling and a multiplication of the agents or middle men who will be involved in the marketing process and

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* See Report of Federal Children's Bureau, Infant Mortality Series.

who will take their remuneration out of the consumers' slender allowance for food.

2. Lack of terminal facilities in the cities and of refrigerating and storage arrangements. The enormous sums added to the costs of the food supply in the cities of New York and Philadelphia have been made evident by official commissions on the subject. The costs added, for example, to eggs between the terminal and the consumer's kitchen were found two years ago to be 30 per cent.

3. Lack of standardization in many kinds of foods, with the notable exception of grains. Many abuses among the distributing agencies are thus made possible.

4. Lack of standards of service among the distributing agencies, growing out of the competitive struggle and the absence of adequate public control. The abuses to which reference is made are, among others, corrupt reporting as to the nature of transactions performed (analagous to the abuse of trust), the use of dishonest weights and measures, adulteration and misbranding of food, agreements for maintaining high prices (forestalling, regrating, etc.), and monopoly methods in marketing essential foodstuffs.

5. Wasteful multiplication of retail agencies.* Nystrom shows that the number of retailers, while not increasing in proportion to the volume of goods sold nor to the value of goods sold, increased between 1860 and 1890 more rapidly than the population and since that time the proportion between population and the number of retailers has remained practically stationary in spite of any and all labor-saving devices, improvements in methods, etc. He is not persuaded that a decrease in the number of establishments would necessarily decrease the cost, because under present methods of dealing the large unit seems to be more costly than the small one; but it is difficult to see why the more efficient use of space, labor, capital would not be made to work out to the advantage of the buyer, in the absence of monopoly advantages.

6. Lack of technical standards among retailers especially among those who deal in retail groceries. The experience of the Harvard Graduate School of Business Administration is of interest in this connection. The School has found it impossible to learn from the books of the grocers in Massachusetts what their methods are because their books show not even what they do. The Harvard School has therefore worked out for the grocers a system of cost accounting, on the basis of which it is hoped that critical analysis may be applied to the methods of the grocers and questions of technical interest find a sound basis for statement and solution. Obviously, where the methods employed are so "hit or miss" as that, and there is no reason to believe that the Massachusetts grocers are less intelligent on these points than those of other communities, there is room for great hidden waste, and need of inquiry and open discussion. The obligation of the gov-

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* Nystrom, Economics of Retailing, Ch. XVII, discusses this question.

ernment to pursue investigations in these fields seems clear.

Attention should be called to the fact that many of the elements of waste are involved in the competitive system as such in which the apparent and near goal is not service but selling. Changes of motive and resulting changes of method will and can come only slowly. Many of the needed changes involve collective community action which will take time to organize and to bring about. Many others involve the solution of technical questions involving investigations and experimentation. In the meantime, as a measure of fair play, two ends should be kept in view. One is the raising of wages rapidly in accordance with the rising prices, and the other is the utilization of governmental resources, in such a way as to alleviate the condition of the weakest and poorest during the period of readjustment and reconstruction.

In view of these considerations the Committee would recommend that the American Public Health Association as a war measure call upon all agencies engaged in the distribution and marketing of food supplies to devise means for eliminating every kind of waste. Your Committee would urge this especially in regard to those foods of which the supply is not especially restricted and which should be used in general consumption in the place of those foods whose supply is limited or which must be depended on for special uses. Milk and eggs are typical foods whose price must be kept within the purchasing power of all in the community, if a decent standard of health, especially among children, is to be maintained. In illustration of the kind of measures to be adopted, the Committee would report three proposals made to the Food Administrator for Illinois by the retail grocers involving the discontinuance of present practices which tend to increase the cost of distribution. These are:

1. That the practice of selling or offering for sale any commodity in the grocery or meat market line at a price which can only be secured by buying a certain quantity of other merchandise be discontinued.

2. That dealers in food commodities be permitted to place reasonable limits on the quantity of merchandise that can be purchased by individual customers.

3. That the practice of food dealers of giving premiums or other gifts with the sale of merchandise be discontinued.

Your Committee would submit two other suggestions:

a. The time has passed when from the standpoint of health there is anything to be feared from food which has been kept in cold storage under right conditions. The housekeeper is still reluctant to accept the verdict of the sanitarian because the food as she receives it and perhaps as she treats it in her kitchen is often so far from satisfactory. It would be a service in extending the use of the cold storage method of preventing waste of food if the Committee on Cold Storage would consider ways and means of getting food from the cold storage warehouse to the consumer in better condition, and also undertake a campaign of education for the housekeeper and cook.

b. The Committee would suggest that an effort be made to establish standards for the condemnation of foods. There is not only great divergence in the different standards adopted, *e. g.* bob veal, but great confusion between æsthetic and hygienic grounds of condemnation. It was pointed out to this Association many years ago by Prof. W. T. Sedwick that the methods followed were not altogether reasonable. It seems to the Committee that the exigencies of war demand a study of salvaging the food supply to the fullest possible extent. An example of one type of method which might be followed may be found in recent modifications in the regulations governing the meat inspection of the United States whereby in case of localized lesions the non-affected parts of an animal may be passed for food. Further illustrations are given in an article on Trichinæ in Pork and Nematodes in Butter Fish by C. W. Stiles, M. D., in the *Journal of the American Medical Association*, March 3, 1917.

Marion Talbot, *Chairman.*
Winifred Stuart Gibbs,
Everett S. Elwood,
George H. Shaw,
Dr. Charles C. Kimball.

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Report of the American Sugar Refining Company. *New York, 1917.*

The report of the American Sugar Refining Company for January to October, 1917, on the conditions of the sugar market outlines the factors which have contributed to the present conditions in the sugar market throughout the world, and presents a brief history of the efforts made by this company to meet the serious condition existing in the American market during the time reported.

Among the new factors which are said to have largely created the extraordinary condition of the sugar market during the past year and at the present time the foremost are: Labor troubles in eastern refineries; the insurrection in Cuba; the shortage in the domestic beet crop; the stories of "sugar shortage" and "sugar famine" which have been published in many newspapers throughout the country; the increased consumption in the United States; the recommendation of the Senate Finance Committee that the drawback on sugar be repealed; and the plans of the United Stated Food Administration for supervision of the sugar industry.

The world's sugar production, we are told has been decreased 11 per cent since the beginning of the war. Furthermore England and France have been compelled to draw heavily upon the supplies formerly consumed by the United States, such as the exports from Cuba and Java.

The Company has tried to prevent hoarding and speculating by regularly selling its daily capacity and distributing it widely among buyers and by advising against hoarding.

The report further takes up the increased consumption of sugar in the United States, showing that in terms of per capita consumption we used for the first ten months in 1916, 68 pounds, while in 1917 the unit for the same period was 76 pounds. This increase may possibly be attributed to the increased use of sugar as a preservative, a result greatly caused by the urging of the Government departments.

The report represents an excellent description of the world's sugar market before and since the declaration of war from the viewpoint of this great company. It is a broad and engaging summing up of this vast industrial problem which by the reading changes from a merely local and personal inconvenience to a tremendous world engulfing problem.

A. D. Hiller.

PROBLEMS OF CANNING OPERATIONS.

Dr. Willard D. Bigelow,
Washington, D. C.

Committee Report before the Food and Drugs Section, American Public Health Association, October 18, 1917, at Washington, D. C.

THE number of domestic products canned is so great that a comprehensive description of canning processes would necessarily include a large amount of detail and would be so voluminous that it would have no place in the scope of this report. These processes are described in considerable detail as applied to commercial canneries in the publications of the Bureau of Chemistry of the United States Department of Agriculture and of the National Canners Association, Washington, D. C. Domestic canning is described in publications of the States Relations Service of the United States Department of Agriculture and the publications of the Experiment Stations and the Departments of Agriculture of several states.

In general, canning processes consist of grading for quality, washing, peeling, trimming, etc., filling into the cans, exhausting, sealing, processing (sterilizing), and cooling. A good product can be obtained only when high grade raw material is employed and all operations are performed quickly and efficiently.

Although all of these operations are vital to the preparation of a high grade product, the sealing of the cans and processing of the filled cans are of especial importance, since both of these operations must be complete to prevent decomposition. The temperature necessary for sterilization varies through wide limits according to the nature of the product. For the destruction of microörganisms, it is well known that a higher temperature is necessary for the spore form than for the vegetative form. Again, the higher the acidity (within the range of the acidity of foods, for instance), the lower the temperature required for sterilizing the food. In general, spore-forming bacteria do not thrive as well in the more strongly acid foods as in foods of very low acidity. For both of these reasons the more strongly acid foods, such as tomatoes and the majority of fruits, can be sterilized at a lower temperature or in a shorter time than foods of lower acidity.

In general foods may be divided into three classes, according to the temperature and time of processing necessary:

1st. Fruits (including tomatoes) which are sterilized at or below the boiling point of water.

2d. Vegetables which, having very low acidity, require a somewhat higher temperature than fruits. They are ordinarily sterilized at a temperature of about 240 degrees F., the time depending on the heat conductivity of the food.

3d. Meat and fish which, probably owing to the difficulty with which they conduct heat to the center of the can, require a slightly higher temperature or longer time of sterilization than the majority of vegetables.

This classification can only be regarded as a rough generalization. It has many exceptions. A number of vegetables (*e. g.*, beets) of very low acidity are sterilized at the boiling point of water and in domestic canning practically all vegetables are processed at that temperature (the heat being continued for two or three hours) and sterilization is usually complete. Again, some fish products as, for instance, sardines, are sterilized at the temperature of boiling water.

THE BACTERIOLOGY OF CANNING.

This is a question regarding which little is known. Since many of the foods, while in the raw state, are in contact with the earth, they may be contaminated with soil bacteria. When we consider the great variety of foods canned, the bacteriology of canning may be almost as extensive a study as the subject of bacteriology itself.

Most types of microörganisms are killed in the processing of canned foods. In some rare cases, microörganisms appear to be present which withstand the heat of sterilization and, if the cans are properly cooled after processing, remain quiescent until the can is stored in a hot place. Such organisms are unusual, but are known to have caused spoilage, especially flat sours. When the closing of the cans is not perfect, bacteria sometimes find their way into the can, either in the water from the cooling tank or subsequently from the air. When a can becomes infected in this way, there would appear to be scarcely any limit to the variety of microörganisms which may be expected. Practically, however, types of organisms will appear which thrive in the constituents characteristic of the food; for example, if sugars are abundant, yeasts and other sugar ferments are usually present; if proteins are prominent and sugars practically absent, then digestors prevail; if the acidity is high, then acid resisting organisms may thrive.

As stated above, no adequate study has been given to the subject of the bacteriology of canned foods, but the matter is receiving attention now at the hands of two members of the committee. It is hoped that a comprehensive report on this subject may be made at an early meeting of this association.

SPOILAGE.

Spoilage in canned foods is usually, perhaps always, due to one of two causes: defective sealing of the can or under-sterilization. In commercial canning, spoilage is usually due to defective sealing of the cans, while in domestic canning it is more commonly the result of under-sterilization. The commercial canner understands better the temperature necessary for sterilization and is equipped with facilities for the high temperatures which give the best results with meat products and with those vegetables which afford more difficulty in sterilization. Spoilage of canned foods is usually made evident by the swelling of the can, but when it is due to acid-forming organisms which do not generate gas, the ends of the can remain flat and the product is known technically as a flat sour. Bulged ends, however, do not necessarily mean spoilage. If the can was sealed without preliminary heating, if it was over-filled, or if it contains a highly acid fruit (especially when stored at a relatively high temperature) the ends of the cans may bulge while the contents remain sterile. This condition is most frequently found with fruits which rarely spoil when the can is tight, but which frequently on long storage or when stored in a hot place have bulged ends because of the hydrogen generated by the action of the fruit acid on the metal of the container. Notwithstanding this fact, a bulged end on a can may safely be regarded by the consumer as a "warning sign" and such a product should not be regarded as merchantable. This question is discussed in considerable detail in Bulletin No. 2 of the National Canners Association.

Food Poisons.

The question of canned foods as a possible source of food poisoning has received practically no attention at the hands of scientific men. Many statements regarding the matter have been made in the popular press. Even writers on the practice of medicine have discussed the subject, but usually such discussions are accompanied by statements on the technology of the industry so greatly at variance with existing conditions that they are given little credence.

Owing to the fact that canned foods are handled largely by machinery, there is not as great chance of their being contaminated with pathogenic organisms as if more hand work were employed. Moreover, those foods which must be prepared by hand are subsequently processed and, although the temperature and time of processing in rare instances is insufficient to effect complete sterilization, it is always sufficient to cause the destruction of all but the most resistant forms of organisms. It appears very improbable that pathogenic organisms resist even the lowest temperatures employed for the sterilization of canned foods.

The thermal death point of most disease producing bacteria lies between 50° and 60° C. when heated for ten minutes in bouillon; while the resistance would be raised considerably due to the concentration of the foods, still the time and temperature usually employed in processing is far in excess of these limits.

Food poisoning from canned foods, if it occurs at all, probably results through the infection of leaking cans. Usually such food is so badly decomposed that it cannot be used. The dangers which may exist during the initial stages of infection are wholly problematical. Fortunately a comprehensive study of this subject has been inaugurated by Harvard Medical School under the direction of Dr. M. J. Rosenau.

Examination of Canned Foods.

Owing to the fact that canned foods are sterilized and that spoilage in cans that reach the consumer is confined to leaky cans which are exceedingly unusual, consumers are likely to assume that the contents of a can require no inspection. This is a mistake. Food should be carefully inspected by the consumer, no matter what its source or what the method of its preparation and storage. When a can of food is purchased or when it is taken for use from the shelf of the consumer, it should be carefully inspected to note whether the ends of the can are still concave (or flat, as it is known in the industry). If the ends are bulged, the contents may still be sound. At the same time, as stated above, a bulged can should be regarded as a warning sign and its contents should not be used for food unless first carefully inspected. When the can is opened, the contents should be removed and inspected the same as any other food. The chances of spoilage, as stated above, are very small, but intelligent housekeeping demands that all food be scrutinized.

In the popular press, warnings are frequently given against storing food in the open can after part of the contents has been removed. The most extravagant statements are frequently made on this subject. It is obvious to one of any scientific information that an open tin can is as suitable for the storage of food as a tin receptacle of any sort. The amount of tin taken up by a food in the one or two days which it is possible to store food in an open can before it is consumed is very much less than the amount taken up from the closed can between the time of canning the product and the time it reaches the consumer's hands. Obviously bacterial spoilage does not occur more rapidly in an open can than in a glass dish.

The general question of the inspection of canned foods, applicable to the home as well as to the laboratory, has been discussed in some detail by one member of the committee. (*Journal of Industrial and Engineering Chemistry*, 1916, Vol. 8, page 1005.)

Labeling.

Probably the most immediate need in making canned foods completely available to the public is a more adequate system of labeling. This is a matter to which much attention has been given, but which is beset by many difficulties. It is not an easy matter to so label a package of food that the consumer (be his information on the subject ever so complete) will get an adequate conception of the character of the contents. It is hard to so label a can of corn that the consumer on reading the label can tell what the corn will look like and what it will taste like, yet the suitability of the label from the standpoint of both the manufacturer and the consumer must be gauged by the extent to which it becomes "the window of the can."

The recognition of this need has been growing for some time in the canning industry and much progress has been made. Labels have already been adopted for peas which will make it possible for the consumer who takes the trouble to inform himself on the subject to know quite accurately from the label the character of the contents of the can.

With many foods the exact designation of such grades will be much more difficult than with peas. With some foods, it will be especially difficult. Great progress can be made in this way, however, and it is believed that, if there is found to be a general demand for such information among consumers, the adoption of classification that will make such labeling possible in a broad way will be greatly hastened.

DR. WILLARD D. BIGELOW, *Chairman.*
DR. CHAS. E. MARSHALL,
DR. E. V. MCCOLLUM,
PROF. JOHN WEINZIRL.

THE BACTERIOLOGY OF SWELLED CANNED SARDINES.

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Presented to the Food and Drugs Section of the American Public Health Association, Washington, D. C., October 17–20, 1917.

INTRODUCTION.

UNDER the auspices of the Biological Board of Canada, Department of Marine and Fisheries, I undertook an investigation into the causes of "swelling" in canned fish in the summer of 1916 at the Atlantic Biological Station, St. Andrews, N. B. During the winter the work was continued in the laboratories at Macdonald College, and in May, 1917 an "Interim Report" was submitted to the Biological Board in Ottawa. The Report, occupying some thirty pages, will shortly be available for distribution, and a detailed account of the investigation thus far will therein be found. In the space here allotted I can do little more than extract and abstract from the interim report.

In a survey of the literature relating to the bacteriology of canned fish, it is found with a few exceptions that the investigations recorded have been undertaken in connection with proved and alleged cases of food poisoning. The exceptions of which I have knowledge are "Microörganisms in the Cannery Industries" by Prescott and Underwood (1897); "Discoloration in Canned Lobsters" by Macphail and Bruère (1897); and "A Bacteriological Study of Sardines" by Obst (1916). Up to the present, my work has been confined to swelled canned sardines and possible influences affecting the same, and on that account the work of Obst if available would be of particular interest. Her report has apparently not yet been published, and the only reference obtainable is an abstract of a paper read before the American Society of Bacteriologists in 1916.

From the food-poisoning point of view, most valuable researches have been published by Auche, Vaughan, Savage, Poels, McWeeney and others.

GENERAL.

Arrangements were made which enabled me to visit the canning factories of New Brunswick. Later, visits were made to several of the large plants operating in the state of Maine. I was thus brought into close touch with the industry of canning as a commercial undertaking, had exceptional opportunities of seeing the methods of packing as generally adopted, and accumulated a store of information as a result of discussions with the canners themselves. It was apparent that the canneries were principally concerned in the packing of sardines, it being hardly necessary to say that the sardines of New Brunswick, and the state of Maine, are small herrings.

I do not propose to enter into a detailed description of the equipment, methods of treatment and system of packing the fish, and general procedure of the factories engaged in the canned fish industry. The one point which must be mentioned is the temperature to which, after packing and sealing, the cans are submitted. The most common can produced is one weighing from 3 to 4 ounces and the sterilization is accomplished by immersion of the cans in baths of boiling water for from 1½ to 2 hours, the time varying in the respective factories. In one or two factories the sterilization consists of heating for a shorter time under pressure at about 225° F.

MEDIA EMPLOYED.

In the early part of the work I prepared and used media from fish concoctions, the ordinary laboratory media, and certain special media. Gradually the fish media has been eliminated as standard laboratory media has proved to be quite satisfactory; moreover, the use of such is convenient, and comparison of strains of bacteria isolated with those described in the literature is made possible. In the preparation of media, the standard methods of the American Public Health Association were in general adhered to, any exceptions being duly noted in my report. All carbohydrates for fermentation tests were prepared separately in 10 per cent solution, and sterilized in flowing steam for 15 minutes on three successive days. When required, these were pipetted into the peptone salt solution previously prepared in tubes, at such rate as gave a resulting 1 per cent sugar broth solution. The acid fuchsin indicator of Andrade, as adopted by Hollman, was used throughout. In the preparation of litmus milk, the litmus was again prepared separately and added to the milk immediately before inoculation.

METHODS.

The procedure followed has largely been determined by experience as the work has progressed, and I am still making further changes which have suggested themselves as advantageous. In the isolation of the bacteria from the cans, direct plating is unsuccessful on account of the oil in which the fish are packed. The cans are sterilized with alcohol, an opening is made, and pieces of fish are removed and inoculated into tubes of liquid media. After suitable incubation, it is a simple matter to withdraw liquid from under the layer of oil in the tubes, and prepare plates in the usual way. From the plates thus obtained, common colonies are streaked on agar, and the work of classification begins.

EXAMINATION OF CANS.

The cans have been obtained either personally or by express:

1. Direct from various canning factories in the province of New Brunswick, and in the state of Maine.
2. From the health department of a city in the Maritime Provinces.
3. From retail grocery stores.

Owing to the varieties of "brands" of sardines produced by the canning factories, the various methods of packing adopted, and the different substances utilized for the giving of flavor and consistency to the finished product, it is not possible other than in a general way to describe the conditions met with in my examinations.

Normal Cans.—In outward appearance there is a complete absence of any "bulging"; the top and bottom are either quite flat or almost imperceptibly concave. On shaking, there is no "rattle" and scarcely any movement of the contents can be heard. When opened with the cutter there is no expulsion of air or gas, with little if any exuding of the oil or other material used in the process of packing. The contents are firm, not macerated, and often white in color; this last, however, depending to some extent upon the materials used in the packing. The smell is mildly characteristic of the fish, qualified by the variety of oil or tomato sauce used. There is in appearance and odor a complete absence of putrefaction. The fish are saturated to a greater or lesser extent with the oil, sauce, or other flavoring agents used, but without losing their firm and solid condition. The oil or sauce will be seen as a layer over and in the interspaces between the individual fish rather than actually within the bodies.

Swelled Cans.—Outwardly the cans vary from a slight "bulged" appearance to a more pronounced swelling. The top and bottom are forced out as a result of the pressure, and present a decided convex surface. As the swelling becomes greater, the oil or sauce will be forced out between the soldered parts of the can and in pronounced cases the outside surface is greasy and wet, and possibly covered with the oil or sauce. Swelled cans, when shaken, have a characteristic "rattle" on account of the extra space within, resulting from the swelling. When the cans are opened, gas is expelled, accompanied in advanced swellings by portions of the liquid contents. In advanced cases there is a tendency for the oil or sauce to pour out over the surface of the cans. The condition of the contents varies considerably. Usually the fish are macerated, disintegrated, and soft, and are intermixed with the oil or sauce; they have lost their entity. The odor is variable—frequently it is not unpleasant, resembling to an accentuated degree the natural smell of normal sardines. In other instances a pronounced putrefactive odor is evident. It may be that the putrefactive odor is present at all times and is masked by the spices or other ingredients of the sauce. That is a point which can only be definitely pronounced upon after a more extended investigation.

BACTERIOLOGICAL DATA.

At the time that the interim report was prepared, forty cans of sardines, "normal" and "swelled," had been examined. Of the "normal" cans many proved to be sterile; from some have been isolated spore-forming bacteria inactive on fermentable carbohydrates; and in no cases have gas-producing bacteria been found.

From the swelled cans, eight strains of gas-producing bacteria have been isolated. These eight strains have been studied morphologically, biologically and biochemically; the report presents the detailed descriptions and tentative classifications:

a. Two strains, liquefying gelatine and failing to ferment lactose, are tentatively placed as *B. vulgaris* (Hauser 1885) Migula 1900.

b. The remaining six strains are lactose-fermenting types; they include typical and atypical types of the *colon-aërogenes* group (Escherich), but for the present the individual classification is not offered.

The gas-producing organisms display an unusual degree of resistance to decolorization with alcohol in the Gram method of staining: when compared, however, with a typical Gram positive lactic acid producing organism, films made from each of the eight strains would be described as Gram negative, with the qualification noted above.

The two cultures of the *B. vulgaris* type, cultures 24 and 37, are motile, coagulate milk, grow well on artificial media, and are facultative anaërobes. The thermal death point is 60° C. for ten minutes, and the optimum temperature for growth is 37° C. Glucose, saccharose, mannite, raffinose, arabinose, xylose, salicin, glycerin and inulin are fermented to acid and to gas. Both cultures are alkaline to the methyl red test, are positive to the Voges-Proskauer reaction, and reduce nitrates to nitrites. Culture 37 produces ropiness in all the culture media and forms indol; Culture 24 does not produce ropiness and does not form indol.

The six strains of the lactose-fermenting types, Cultures 26, 32, 34, 35, 36, 64, show considerable variation respectively in many of their characteristics. Each, however, is a facultative anaërobe and grows particularly well at 37° C. Five of the cultures are killed under laboratory conditions at 60° C. for ten minutes; the thermal death point of the remaining culture has not yet definitely been determined but it is not higher than 70° C. for ten minutes. As to their biochemical reactions they vary respectively as to the production of indol, the reduction of nitrates to nitrites, the Voges-Proskauer reaction and the methyl red reaction. Each of the six strains ferment to acid and gas the following carbohydrates: glucose, lactose, saccharose, mannite, arabinose, and xylose. The action upon the remaining substances used is shown in the table on the following page.

EXPERIMENTAL SWELLED CANS.

Having isolated strains of gas-producing bacteria from swelled cans of sardines and having determined their cultural features and biochemical reactions, the next step was to attempt the

Culture.	Dulcite.	Adonite.	Raffinose.	Salicin.	Aesculin.	Glycerin.	Inulin.
32	+−	−−	++	++	++	++	++
36	−−	−−	+−	−−	±−	+−	+−
26	+−	−−	++	++	++	+−	+±
34	++	−−	++	++	++	+−	++
35	+±	++	++	++	++	++	++
64	−−	−−	++	++	++	+±	++

+ = acid
++ = acid and gas.

experimental swelling of normal cans by inoculation with organisms already isolated. Up to the present three of the cultures have been used for this purpose, one *B. vulgaris* type, Culture 37, and two varieties of the *colon-aërogenes* group, Cultures 35 and 64. Normal cans have been inoculated with the three cultures respectively, a suitable number of controls receiving exactly the same treatment minus the inoculation. In each case experimental "swellings" typical in every respect have been produced by the inoculation. The organisms subsequently isolated have been proved culturally to be identical with those used for inoculation. Thus the "Postulates of Koch" have been satisfied.

FURTHER WORK.

Since the interim report was submitted I have continued the investigation at St. Andrews and in the laboratories at Macdonald College. Experimental work has been conducted under commercial conditions, and evidence has been sought with a view to establishing the source of the organisms responsible for the "swelling" of the cans. As the evidence accumulates it seems likely that the completion of this second phase will provide data such as will warrant advice as to means whereby the trouble may be eliminated.

I desire to express my indebtedness to Dr. A. B. Macallum and to Dr. A. G. Huntsman of the Biological Board; to Dr. F. C. Harrison of Macdonald College; to the Maine inspectors of the National Canners Association of America; and to the proprietors and managers of the various canning factories which we were permitted to visit.

NOTE.—For Bibliography see original "Interim Report." Ottawa, Can.

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The Immediate Reaction after Vaccination.—An editorial in the *Journal of the American Medical Association* emphasizes the desirability of paying greater attention to skin reactions in cases of revaccination. In the words of Jenner, "A disposition to sudden cuticular inflammation" may be noted in revaccinations long after the primary vaccination. These atypical responses to vaccine are of two kinds—immediate or accelerated. The immediate reaction occurs within twenty-four hours and consists of an areola which quickly fades without the formation of a vesicle. The assumption is that sufficient antibodies are still present as a result of the primary vaccination to act at once on the vaccine. In the case of an accelerated reaction, antibodies are not present sufficient to give an immediate reaction; but none the less the cells can form them more readily than normally. The result is a more rapid and atypical "take" than normal, consisting of a large areola and a small vesicle at about the fifth day.

These atypical reactions are really valuable and serve to bring the individual's immunity to a higher level. For this reason they are worth observing and recording by health officers.

(*M. E. C.*)

COLD STORAGE—ITS CAPABILITIES AND HOW TO BEST UTILIZE AND EXTEND THEM.

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President, Merchants' Refrigerating Co., New York City.

Read before the Food and Drugs Section, American Public Health Association, at Washington, D. C., October 18, 1917.

AS THE president of the American Association of Refrigeration and therefore an official spokesman of the refrigerating industry, I desire to express the appreciative thanks of the cold storage warehousemen of the country and affiliated lines of business for the excellent work of the Committee on Cold Storage of the American Public Health Association and the series of comprehensive and constructive reports which your committee has presuited. These deliverances and other similar investigations have had much to do in bringing about a better understanding of the cold storage process and allaying the popular prejudice especially on the question of the wholesomeness of cold storage products.

There is no greater asset in the all important subject of perishable food conservation than refrigeration from the pre-cooling plant of the producer to the family refrigerator of the consumer. Through all the process of preparation, accumulation, transportation, storage and distribution, artificial refrigeration is a vital necessity.

This paper has to deal with cold storage, however, as or of the chief agencies of food conservation. It is well to define cold storage in order to distinguish period conservation from temporary preservation. In the license proclamation of the president, cold storage is defined as follows: "A cold storage warehouse shall mean any place artificially or mechanically cooled to or below a temperature of 45 degrees above zero Fahrenheit, in which food products are placed and held for thirty days or more." There has been much confusion in many suggestions which have been made concerning the use of cold storage to save from waste the big surplus of fruits and vegetables. Outside of apples, pears, celery and in some sections potatoes and onions, very few of these products can be successfully carried in cold storage. The proposition of using ice storage houses and brewery plants must deal with local conditions on a coöperative basis, taking into consideration temperature, insulation and period available of the houses carrying the product whether the articles will stand the cost of storage and cartage, and whether the operators are willing to undertake the responsibilities of warehousemen under the Warehouse Receipts Act of the respective state. The present world war is demonstrating the capabilities of cold storage, its adaptation to existing economic condition and has encouraged a general extension of refrigerated warehouse capacity.

It has been said that food will help win the war and the truth of this statement is becoming more and more apparent. Our government has taken action wisely in reference to this vital problem by enacting the Food Administration Law providing "for the national security and defense by encouraging the production, conserving the supply, and controlling the distribution of food products and fuel." It should be remembered that the main aim of the Federal Food Act as just stated is to stimulate production, eliminate waste and harmful practices, so that our own people and our Allies shall be provided with food at reasonable cost, not forgetting that the law does not touch the producers nor the small retailers. We must always keep in mind the danger, menace and disturbing consequences, if the poorer classes of our population are under-fed, under-nourished and therefore discontented, if not desperate, because of high and prohibitive prices. Inevitably this condition must lead to social unrest, disorder, food riots, and have a tendency to promote a radical propaganda of a socialistic character. Food, like air and water, is an indispensable necessity to human life, and is required continuously, day in and day out, and therefore any economic disturbance which affects the price of foodstuffs is quickly reflected in public agitation and clamor for relief. At such times the agencies for food distribution must either accept reasonable regulation or submit to drastic and radical government control. The present economic situation must be considered in order that the capabilities of cold storage for food conservation should be fully utilized but not abused, and for the purpose of establishing public confidence.

The cold storage warehouses during the war have performed a service which has been indispensable, not only in the seasonable distribution of our perishable foods, produced in surplus quantities throughout the period of scant or no production, but as reserve reservoirs available as emergency depositories for the proper care of our foodstuffs accumulated under unusual war conditions. The disarrangement of export business, the extraordinary demands of the government and the emphasis on food conservation are conditions which have emphasized the essential value of the cold storage plants. The vast machinery of perishable food production, accumulation and distribution requires the fly wheel cold storage as a stabilizing and steadying influence.

As an evidence of the present status and utilization of cold storage it is interesting to study briefly some of the statistics of the industry during the war period to visualize the extent and importance of the part it is playing these times.

The following figures are compiled by the Bureau of Markets, United States Department of Agriculture, with reference to the cold storage space in the United States October 1, 1917:

	Cubic Feet.
Freezing space below 29° F.	78,658,149
Cold storage space above 29° F.	158,051,916
Total	236,710,065
Proposed cold storage space covering warehouses in course of construction	18,795,780
Grand Total	255,505,845

The total cold storage space in the United States in packing houses amounts to	212,310,299
Proposed additional packing houses and cold storage buildings in course of construction	6,428,010
Grand total packing house cold storage space	218,738,309
Combined totals cold storage and packing house both present and proposed capacity	474,244,154

The Bureau of Markets, United States Department of Agriculture, is furnishing a very valuable service in publishing reports showing cold storage holdings in the United States. Up to the present time the figures have been furnished voluntarily by the trade, and much credit is due the Bureau of Markets for the splendid work it has been doing in securing such general participation in furnishing these statistics. It is also noteworthy that practically every cold storage company in the country responded to the invitation to send in their figures.

Under the new Food Production Law the Department has the power to require all concerns to report their holdings. The Bureau of Markets began reporting on apples in 1914.

Reports on butter, eggs, cheese, and meats were begun in 1916 and poultry, frozen eggs and packing stock butter have been added this year. It is expected that reports on fish and other products will follow.

On all products September 1, 1917, 1,276 establishments are now reporting with the following number of warehouses reporting on each of the following commodities:

	Sept. 1, 1917.	Oct. 1, 1917.
Butter (creamery)	335	380
Packing stock butter	82	107
Cheese (American)	373	438
Eggs	400	440
Frozen eggs	148	170
Frozen beef	265	293
Cured beef	293	327
Frozen pork	259	276
Dry salt pork	389	415
Sweet pickled pork	481	508
Lard	482	520
Lamb and mutton frozen	149	163
Broilers	116	134
Roasters	122	126
Fowls	124	139
Turkeys	127	133
Miscellaneous poultry	171	202
Total poultry	220	254
Apples	569	

Maximum quantities reported since this work began are shown by the following table:

Commodities.	Date.	No. of Firms.	Amounts.
Butter (creamery)	Sept., 1916	166	102,843,822 lbs.
Packing stock butter	Sept., 1916	82	2,496,054 lbs.
Cheese (American)	Sept., 1916	373	776,098,428 lbs.
Eggs	Sept., 1916	358	6,425,810 cases
Frozen eggs	Sept., 1916	148	17,008,575 lbs.
Frozen beef	Feb., 1917	190	189,138,253 lbs.
Cured beef	Aug., 1917	278	41,557,780 lbs.
Frozen pork	Aug., 1917	253	93,684,410 lbs.
Dry salt pork	March, 1917	322	246,191,182 lbs.
Sweet pickled pork	July, 1917	430	398,380,922 lbs.
Lard	Aug., 1917	456	109,528,373 lbs.
Lamb and mutton frozen	Feb., 1917	114	5,800,457 lbs.
Broilers	June, 1917	103	4,247,122 lbs.
Roasters	May, 1917	122	6,356,370 lbs.
Fowls	May, 1917	123	6,341,474 lbs.
Turkeys	July, 1917	117	3,743,868 lbs.
Miscellaneous poultry	May, 1917	164	45,340,626 lbs.
Total poultry	June, 1917	179	54,834,191 lbs.
Apples	Dec., 1915	3352	5,435,211 bbls. (4,299,666 bbls. and 3,406,635 bxs.)

The above figures clearly indicate the importance and scope of the cold storage industry in food conservation.

Mr. I. C. Franklin, the capable representative of the Bureau of Markets, in charge of the cold storage work, in an address delivered before the National Live Stock Exchange at Louisville, Kentucky, in May, 1917, estimated that the value of cold storage products in warehouses on January 1 of this year, amounted to $186,255,000. It should be remembered, however, that this estimate was made at the time when stocks are at a low point and that the articles covered were only apples, butter, cheese, eggs, meat and lard.

As a matter of interest I desire to give herewith the foodstuffs held in cold storage in Canada on September 1 of this year. It will be seen that the figures run much smaller than in the United States.

Eggs	14,948,540 dozen	498,285 cases
Butter	20,480,809 lbs.	
Cheese	19,693,704 lbs.	
Meat	58,523,027 lbs.	
Fish	15,546,732 lbs.	
Fowl	1,844,207 lbs.	

There has been a change in the public attitude towards cold storage in the past few years. You now hear much less than formerly concerning the cold storage process being unsanitary or injurious to the public health. All authorities and experts agree that when the products are in proper condition when placed in cold storage, they will come out in the same way. There is now no question about the soundness and wholesomeness of cold storage products. A more general acceptance of the necessity of cold storage is very apparent, but there has been much discussion concerning some of the questionable practices, especially in war time, in connection with injurious speculation on food products carried in cold storage. The public do not discriminate when they hear of extreme cases of large speculative profits made on certain limited quantities of foodstuffs, and at once conclude that this is a regular condition rather than a very unusual occurrence. It is often thought that cold storage operates to materially increase the cost of food, when it really adds to the volume and lowers the average price.

The most important piece of legislation in reference to food matters is, of course, the new United States Food Administration Law. This is a war measure, but it is quite possible that many of its provisions may survive the war and become part of the permanent law in regard to food. In general, the Food Administration Law affects the cold storage industry in two quite opposite directions. In the first place its purpose is to encourage production, prevent waste and conserve the food supply. This is the precise and exact function of cold storage and there is no better agency in existence to do this with regard to our perishable food products. It is at this point that the cold storage industry can render its greatest service to the government and our Allies. The Food Administration, under the theory of the law and by its propaganda, has insistently urged the people to produce, produce, produce. While in the case of the small gardens, in the raising of fruits and vegetables, the family may "eat what they can and can what they can't" the great staple perishable foods produced as articles of commerce, such as poultry, butter, eggs, fish, meat, green and dried fruit and the like, must be preserved and carried over through the winter under refrigeration. The winter season and its food supply is the great test of the war. We hear it said that whether or not our enemy can continue to withstand the attack of the Allies depends upon his ability to feed his soldiers and population through the winter of 1918, even if he survives the approaching cold season. It is also true of our own country that food conditions in the winter will determine the question of the health and contentment of the people at home and the fighting morale of our troops abroad. The greatest piece of constructive work, therefore, that the food industries can do is to encourage production in every possible way and then conserve the surplus for distribution throughout the non-producive months of the year. But this must be done at the least possible cost to the ultimate consumer. There must be no profiteering here, but only reasonable and legitimate charges and profits based on the service rendered in the handling of these foods. Because of the disarrangement of economic laws due to war conditions by reason of abnormal demand and inadequate supply and to prevent injurious speculation, manipulation and taking advantage of the world calamity for excessive gain, the law, in addition to its constructive side, expressly prohibits hoarding, unfair and wasteful practices and injurious speculation.

The Food Administration Act in defining hoarding expressly excepts the legitimate and reasonable carrying of seasonable food products in cold storage. The language of the law in this respect is as follows:

"Necessities shall be deemed to be hoarded within the meaning of this Act when held, contracted for or arranged for by any manufacturer, wholesaler, retailer or other dealer in a quantity in excess of the reasonable requirements of his business for use or sale by him for a reasonable *time or reasonably required to furnish necessities produced in surplus quantities seasonably throughout the period of scant or no production.*"

The last phrase quoted was inserted in the bill by the Committee on Agriculture of the House of Representatives as the result of the suggestion of such an amendment made by the speaker at the hearings on the bill. This action and the invitation to have the American Association of Refrigeration and other cold storage interests participate in the Food Administration activities indicate the desire of Congress and those to whom the execution of the law has been committed to recognize and safeguard the legitimate function of the cold storage business.

The cold storage industry, like many other lines of business, quickly responded to the invitation to coöperate with the government in the matter of food administration and formally offered their services to Mr. Herbert Hoover for service in whatever capacity might be desired. Such coöperation is now being rendered on the basis of primal duty and responsibility to the government, but also for the purpose of interpreting the industry from the practical standpoint to the Food Administration.

The public cold storage industry is a semi-public utility agency in the handling and distribution of food, and therefore any proper and wise governmental regulation, especially in war times, is most welcome. In no other way can public confidence be so readily secured, the largest utilization of cold storage facilities be made available, and the possibility of unfair practices and abuses eliminated. The general purpose of the Food Administration Act is to provide that our food products shall pass from the producer to the consumer in as direct a line as possible without unnecessary speculative operations, but with proper and adequate compensation for services rendered in the distributing processes. The President of the United States has just issued a proclamation under the license clause of the law decreeing that the handling of and dealing in certain commodities shall be licensed November 1, 1917. This includes all who handle the stipulated food products which embrace the perishable foods usually carried in cold storage including the manufacturer, dealer, commission merchant, broker and cold storage warehouseman, but excluding the producer and the retailer doing a business of less than $100,000 per year. It is encumbent upon all who come under the requirement to apply at once for a license for such operations and products as their business demands.

Under the license the cold storage warehousemen will be required to subscribe to and obey the general rules and regulations which will be promulgated and which will apply to all licenses alike. In addition there will be special rules applicable to warehousemen just as there may be special regulations for the other agencies of food distribution not exempted. The special rules under consideration for cold storage warehousemen are for the purpose of carrying out the purpose and intent of the law both with regard to the warehouses and the products stored therein, to promote uniformity of regulation and standardization of practices, and to provide for such reports of holding, storage space and the like as may be required from time to time. Pursuant to the above the warehousemen will probably be required to classify as either a public cold storage warehouseman, a private cold storage warehouseman or a combined public and private cold storage warehouseman, according to definitions given. The public cold storage warehousemen cannot own or deal in food products stored directly or indirectly, and the other two classes of warehousemen must carry a license for their merchandizing operations. The combined public and private warehouseman must indicate his dual capacity on all warehouse receipts issued.

Licensed warehouses doubtless will be asked to file their schedule of rates subject to change on notice, but will not be allowed to make rebates or discriminatory allowances. Loans on commodities to be licensed either made directly or indirectly probably will be limited to a maximum of 70 per cent of the market value of the product on the date of the loan including all advanced charges.

It is likely that all warehousemen will be required to mark certain products on their containers with the date of receipt and delivery, the name and location of the cold storage warehouse and with the words "Cold Storage," and be prohibited from receiving food products apparently unfit for human consumption.

The Advisory Committee, officially representing the cold storage industries of the country, have approved of the policy of regulation and also the specific requirements of the rules under consideration, and believes that, when the matter has been finally determined upon, the entire industry and their patrons will cheerfully coöperate and assist in making effective the rules and regulations to be promulgated by the President.

There are many who believe that the world and our country are passing through a re-making process and that after the war is over we shall enter upon a better day. It is altogether possible that many of the features of the governmental regulation of our food products imposed as a war measure may be found to be most desirable as a permanent part in the economic life of the nation. We now have an unusual opportunity to serve the nation, correct dangerous tendencies and practices and establish the business of food distribution on a higher basis and under better standards.

When the war is over our nation will be in the forefront as a great international force for reconstructed civilization. Commerce and business will have no little part to play in this process of rebuilding for the future generations. Food distribution and conservation will necessarily have an increasingly important place in the new structure. Let us hope that as a result of this war we shall have established not only political democracy but also industrial and commercial democracy as well, in which the people through a representative form of government shall wisely control all essential activities in the interests of equality, liberty, justice and progress. If this shall be accomplished autocracy, militarism and organized frightfulness will be abolished forever on the one hand, and on the other the extreme of radicalism and socialism made impossible in our beloved land.

MILK STANDARDS.

Dr. C. E. North,
New York City.

Preliminary Committee Report to the American Public Health Association.

THE Committee begs to report as follows:

1. *Resolved* that "All milk should be classified by dividing it into three grades which shall be designated by the letters of the alphabet." The requirements for the three grades should be as follows:

Grade A.

2. *Raw Milk.*—Milk of this class should come from cows free from disease as determined by tuberculin tests and physical examinations by a qualified veterinarian, and should be produced and handled by employees free from disease as determined by medical inspection of a qualified physician, under sanitary conditions, such that the bacterial count does not exceed 10,000 per cubic centimeter at the time of delivery to the consumer. It is recommended that dairies from which this supply is obtained score at least 80 on the United States Bureau of Animal Industry score card.

3. *Pasteurized Milk.*—Milk of this class should come from cows free from disease as determined by physical examinations by a qualified veterinarian, and be produced and handled under sanitary conditions, such that the bacteria count at no time exceeds 200,000 per cubic centimeter. All milk of this class should be pasteurized under official supervision, and the bacterial count should not exceed 10,000 per cubic centimeter at the time of delivery to the consumer. It is recommended that dairies from which this supply is obtained score at least 65 on the United States Bureau of Animal Industry score card.

Grade B.

4. Milk of this class should come from cows free from disease as determined by physical examinations, of which one each year be by a qualified veterinarian, and should be produced and handled under sanitary conditions, such that the bacteria count at no time exceeds 1,000,000 per cubic centimeter. All milk of this class should be pasteurized under official supervision, and the bacterial count should not exceed 50,000 per cubic centimeter when delivered to the consumer.

It is recommended that dairies producing Grade B milk should be scored, and that the health departments or the controlling departments, whatever they may be, strive to bring these sources up as rapidly as possible.

Grade C.

5. Milk of this class should come from cows free from disease, as determined by physical examinations, and should include all milk that is produced under conditions such that the bacterial count is in excess of 1,000,000 per cubic centimeter.

All milk of this class should be pasteurized, or heated to a higher temperature, and should contain less than 50,000 bacteria per cubic centimeter when delivered to the consumer.

6. Whenever any large city or community finds it necessary, on account of the length of haul or other peculiar conditions, to allow the sale of Grade C milk, its sale should be surrounded by safeguards such as to insure the restriction of its use to cooking and manufacturing purposes.

C. E. North, *Chairman.*
Jas. S. Neff,
A. D. Melvin.

October 17, 1917.

UNIFORM STATISTICS OF MENTAL DISEASES.

Horatio M. Pollock, Ph. D.,
First Lieutenant, Sanitary Corps, U. S. A.

Read before the Annual Meeting of the American Public Health Association, Section on Vital Statistics, Washington, D. C., October 18, 1917.

THE greatest achievement of the present age is the triumph of science over disease and death. During the thirty-year period from 1885 to 1915, the civilized world made more progress in eliminating disease and banishing death than it had made in the preceding thousand years. This great gain was the direct result of many important scientific discoveries and achievements, which in turn arose from intensive study of the nature and causes of disease and the conditions of health. It was a transcendent day in human history when the conclusion was reached that an epidemic is evidence, not of the wrath and vengeance of God, but of the ignorance and neglect of man; when the scientist opened God's great book of nature to read therefrom the laws of health and disease, and of life and death, and found written therein in blazing letters: "To him that knoweth and obeyeth these laws shall be given health, long life, and a blessed posterity; but to him that harkeneth not to these words shall come sorrow and shortened days, and his race shall disappear from the face of the earth."

Following this injunction, we have been learning the mysteries of the great plagues that so terrorized our forefathers, and as we lighted the torch of science, the plagues disappeared. The bubonic plague, cholera, yellow fever, and smallpox are now but memories of their former ghastliness, while typhoid fever, malaria, diphtheria, pneumonia, and even tuberculosis are gradually melting away as the torch becomes brighter.

This reference to the triumph of science over disease and death is an old story, but it prepares the way for another story that is not so complimentary to our age and race. This other story has to do with mental diseases—diseases which are still practically unknown except to specialists, but which from the standpoint of economics and social welfare are vastly more important than many well-known physical diseases.

Take dementia præcox, for example. Although many intelligent people have never heard the term, there are probably 200,000 cases of dementia præcox in the United States at the present time, more than half of which are in institutions. New York State alone has 20,000 cases continuously in its State Hospitals and is maintaining them at an approximate expense of $6,000,000 a year. This is more than is paid by the state for the care even of the tuberculous. Dementia præcox is believed by many to be preventable, but practically no steps are being taken to prevent it. Likewise many other forms of mental disease could doubtless be prevented, but no progress can be made in preventing disease, especially mental disease, until its nature is known and the importance of action reaches the consciousness of the common people.

The definite facts we now have concerning mental diseases in the United States as a whole are very meager and do not form an adequate basis of approach for the great work of prevention that must soon begin. We know approximately how many people suffering from mental disease are housed in institutions in this country, but we have no general statistics concerning the diagnosis of these cases or the cause of their mental breakdown. The statistics prepared in institutions for the insane in different states cannot be combined or compared, because they were not compiled in the same way or on the same basis. It is likewise impossible to compare statistics of mental disease in this country with those in other countries. It is not strange that the old legend that our hospitals for the insane are filled principally with farmers' wives who become deranged from lonesomeness still persists. It is not strange that the anti-cigarette advocate is still able to state to believing hearers that a large percentage of insanity is due to indulgence in so-called "coffin-tacks." It is not strange that prohibitionist orators of the rabid sort are still able to convince their audiences that the "bulk of insanity" is due to drinking too deep from the "cup that cheers and also inebriates." If those in the actual work of treating the insane cannot obtain accurate data concerning mental diseases throughout the country, how can the general public be expected to know whether current statements are correct or not?

Important steps in the right direction, however, are being taken. The American Medico-Psychological Association, at its meeting in New York in May last, adopted a classification of mental diseases and a series of forms for uniform statistical reports. As that Association comprises most of the superintendents of institutions for the insane in the country, the action taken has large significance. A standing committee on statistics was appointed, and an effort will be made to secure the adoption of the Association's classification by federal and state authorities. When this is done, the way will be clear for the collection of uniform national statistics of mental diseases, hitherto an impossibility. The compilation of these statistics will ultimately be a governmental function, but for a time at least it is believed that the work can best be done by the American Medico-Psychological Association in co-operation with the National Committee for Mental Hygiene.

That such uniform statistics of mental diseases are within the range of practicability is shown by the experience of New York State during the past twelve years. In 1905 a new classification of mental diseases was adopted by the state hospitals, and in 1908 the Commission in Lunacy appointed a statistician and required the hospitals to submit statistical cards giving data concerning each case admitted, re-admitted, discharged, or deceased. From such cards yearly statistical reports have been prepared and the cards have been filed according to identification, number, and psychosis. The Commission now has a file of uniform cards of about 50,000 first admissions—the largest collection of systematic data concerning mental diseases in the world. Its Bureau of Statistics is now able to study the separate mental diseases and has enough cases to form the basis of safe statistical conclusions. Studies already made throw considerable light on many perplexing problems and answer definitely many important questions that otherwise would remain unanswered.

The success of New York's pioneer work in collecting statistics of mental diseases led the American Medico-Psychological Association to take the steps in the same direction already indicated.

The recently established division of neurology, psychiatry, and psychology in the United States Army has adopted a similar method and will use the Association's classification in reporting the psychiatric examinations of the troops now being organized for service in Europe. The statistics compiled from these reports will throw light on the prevalence of nervous and mental diseases and defects among the young men of the country and will show the extent to which these diseases develop during army service. Already enough has been done to demonstrate the necessity of sorting out the mentally unfit before sending an army into the field.

It is significant that while the rate of physical disease and of mortality has been steadily declining, the rate of insanity has apparently been mounting upward. Already the number of hospital beds occupied by the insane, exceeds the total number of hospital beds for general physical diseases of all kinds in the United States. The total yearly economic loss to our nation on account of insanity is now more than $350,000,000. Is it any wonder that those of us who see the enormity of the burden of mental diseases should advocate that they be studied in every possible way—in the laboratory, in the hospital, in the clinic, and that the results of such study be so reported that they may be made available to all workers in the field, to the end that the mental health of our people may be made more secure? Only when the facts concerning the cause, course and outcome of the various mental diseases are fully known shall we be able to solve successfully the great problems of cure and prevention.

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RECENT VITAL STATISTICS LEGISLATION.

Report of Committee on Legislation read before the American Public Health Association, Section on Vital Statistics, Washington, D. C., October 19, 1917.

FROM a legislative standpoint, the registration of births and deaths is today probably in better shape than ever before in the history of the United States. Illinois and Oklahoma are in a position for the first time to secure complete registration, and a number of other states have made minor amendments which should result in improved registration. Iowa has taken what is believed to be a backward step in the enactment of a law which the committee feels cannot be effective. So, we may say that there has been a gain of two important states compared with a possible loss of one.

The committee sent a questionnaire to the officials of every state asking information relative to vital statistics legislation, the approximate number of birth and death certificates registered, and the amount of expenditures, with the hope of securing some idea of the average cost of maintaining a statistical bureau; the appropriations, however, are so diverse, some covering salaries only, some including rent, printing, etc., that it seemed inadvisable to attempt any tabulations or calculations which were likely to be incomparable.

Following are abstracts and comments on the more important acts relating to the registration of births and deaths.

Arkansas.

A law was passed providing for marriage registration and a marriage registration fee, which fees are to be used for the support of the vital statistics division,—this modeled after the Kansas law.

California.

The legislature of this year has practically rewritten the entire vital statistics law, amending twelve of the twenty-four sections. These amendments practically bring the law to the standard of the model law. Probably the most important feature of the California law is the time limit for filing certificates of birth, which is fixed at thirty-six hours after the birth of the child, except in rural communities having no direct mail service where a reasonable time may be allowed for filing. The new act is practical and scientific and will make for better reports.

ILLINOIS.

While Illinois enacted a model vital statistics law in 1915, the legislature failed to make sufficient provision to put it into successful operation, and it remained for the legislature of 1917 to provide for the reorganization and modernization of the entire public health service. Under this new organization vital statistics is made a definite division of the work of the department, and there can be no question that, given efficient administration, Illinois will have for the first time complete registration.

IOWA.

Vital statistics in Iowa have never been satisfactory, and it is to be deplored that the Thirty-seventh General Assembly which closed its session in April of this year, was so badly advised as to enact a new law for the registration of vital statistics which does not include any of the essentials of the model law, and which the committee feels is not only utterly inadequate but a real backward step for it will probably have to be proven that the law will not accomplish results expected before the legislature will consent to its repeal and the enactment of a model law. This may take many years and makes the hope of national vital statistics at least that much further away. Iowa is an important state of two and one-quarter million people, and the fact that it can hardly hope to secure recognition in the Registration Area under this law is unfortunate.

The law, which is chapter 326, Session Laws of 1917, provides in Section 1 that the secretary of the State Board of Health shall be the state registrar without additional salary.

Section 2 provides that the undertaker or person in charge of any burial shall make a death certificate in duplicate and shall issue a burial permit (to himself), the original certificate to be sent to the state registrar on or before the 5th of the following month, the duplicate together with the permit to be delivered to the person in charge of the cemetery. It will be observed that there is no local supervision of deaths or interments, no one is paid for supervision, the undertaker is not required to report if he has no certificates to file and if he does not report no one knows anything about it, and the small appropriations to the state department preclude the possibility of maintaining an adequate inspection service.

Section 3 provides that the state registrar shall furnish all blanks, etc.

Section 4 provides that the state registrar is required to furnish annually to the clerk of the district court certified transcripts of the original certificates for the purpose of maintaining a county record, and provides that the United States Bureau of the Census shall have access to the records for the purpose of transcription.

Section 5 provides that the clerk of the district court shall be the county registrar for birth registration.

Section 6 provides that the physician or midwife in attendance on a birth shall file a certificate (standard form) with the clerk of the district court within ten days.

Section 7 provides for a record book to be kept by the clerk, etc., and the original certificates sent monthly to the state registrar, and in case no certificates are filed he shall so report, and also provides for the care of the records with the state registrar.

Section 8 provides that the state registrar shall furnish birth registration blanks.

Section 9 makes an appropriation of three thousand dollars annually for carrying on the work.

Section 10 provides for the local record of marriages and divorces and an annual report of same to the state registrar.

Section 11 provides for certified copies of records.

Section 12 is a general penalty clause providing fines of $5.00 to $100.00 or imprisonment of not more than thirty days for violation of provisions of the Act.

Section 13 fixes the time for the law to go into effect as January 1, 1918.

Section 14 is a general repeal section.

MARYLAND.

Several changes in the vital statistics law of Maryland were made by the legislature of this year, but none of them are organic, many being minor changes having to do with the administration of the law. Possibly the most interesting change is the provision for the payment of a fee to the local registrar for the issuance of a burial permit for bodies shipped in from outside the state, for interment; this is unusual.

NEBRASKA.

Nebraska passed an amendment having to do largely with sub-registrars, but which will not in any way aid in securing better returns, complete returns being impossible under the existing general law.

NEW YORK.

There was enacted legislation giving the State Commissioner of Health authority to divide primary registration districts where it seemed advisable so to do; also, providing that state institutions should constitute primary registration districts; also, new legislation providing for a fee of twenty-five cents to local registrars for issuance of a burial permit.

OKLAHOMA.

Oklahoma passed a model vital statistics law which seems to be effective and without any untoward features. The items required in the standard certificate of death and birth are specified in the law, the only change from the standard form being in the death certificate where the maiden name and birthplace of mother is omitted. This is probably unfortunate, as the deceased is not officially identified with the mother's family, and might have serious legal significance in some question of inheritance by descent. Under aggressive administration Oklahoma should obtain complete registration. The law became effective July 1, 1917.

OREGON.

Some small amendments were made to the vital statistics law of Oregon, one of which provides that in places of two thousand population or over where the health officer is the local registrar he shall receive no additional remuneration. The law also amends the section which specifies the items of the standard certificate of birth and omits the name of the father; the exact purpose of this change is not clear.

TEXAS.

By amendment Texas adopts the standard birth and death certificate, and makes some minor changes in the law which on the whole tend to strengthen it and make its administration more effective.

The following states made no reply to the inquiry from the committee: Colorado, New Mexico, Pennsylvania, Utah, Idaho, Illinois and Nevada. Of these states, however, the Session Laws were examined for New Mexico, Utah, Idaho and Nevada, the other state Session Laws not being available.*

Respectfully submitted,

CHARLES V. CHAPIN, M. D., *Chairman.*
W. C. WOODWARD, M. D.
W. J. V. DEACON, M. D.

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*A summary of answers to the questionnaire is omitted for want of space. This may be obtained from the chairman.—EDITOR.

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DISPOSAL OF GARBAGE BY HOG FEEDING.

The Food Administration has done most wisely in urging the utilization of garbage by hog feeding. Greater value can be obtained from garbage in this way than in any other. The outlay for the plant is small as compared with reduction works and incinerators and depreciation is small. In fact the land on which hogs are fed appreciates in value. Incineration is expensive and wasteful and is going out of favor. Reduction is more rational, but is not so economical as hog raising. Reduction is too expensive for small cities, but hog feeding can easily be undertaken by such.

The reason that hogs have not been used more for garbage disposal is because this has been so frowned on by health officials. Because the average hog farm smells bad the average health officer thought it must be a menace to health. Fortunately the bugaboo of bad odors is fast disappearing. Of course nuisances of this kind should be reduced to a minimum, but it is a question whether anything is gained by substituting a city garbage works for a country hog farm. It is also alleged that garbage-fed pork is of poor quality and carries disease, especially tuberculosis. The report of the recent conference on garbage feeding, called by the United States Food Administration, shows that such pork is equal in quality and value to corn fed pork. As to infection with tuberculosis and trichinosis, it is of little moment, as meat is cooked before eating, but as a matter of fact there is no excess of these diseases in garbage-fed animals.

If health officers would encourage better methods, the nuisance from garbage feeding could be reduced to a permissible minimum and much money could be saved our cities which could be used for baby nurses and venereal clinics and so really save lives and prevent sickness. At the conference above mentioned agricultural officials and practical feeders discussed such matters as breeds, housing, methods of feeding, protection against disease by inoculation and otherwise and the prevention of nuisance. It is hoped that this is the beginning of an earnest scientific study of this problem. C. V. C.

THE CAMPAIGN AGAINST VENEREAL DISEASE.

Upon four distinct lines of advance, the campaign against venereal diseases is proceeding, which, opened by the Surgeons-General of the Army and Navy, is now actively reinforced by the Public Health Service, the Red Cross, state health departments, state councils of defense, governors, mayors, and other city officials and agencies. One main line of advance is that of public health. The objective is the control of these diseases as other communicable diseases are controlled—the rationale being, first find your case, then cure it. Hence, a system of reporting cases is being adopted, or where already existing is being enforced; twenty-one states now have regulations to this end. An interesting feature of several of the report blanks in use is the "warning" to be detached by the physician and given to his patient. This warning contains a brief but unmistakably clear explanation of the dangers of venereal diseases, and a statement of the law concerning anyone infected therewith. Another important public health measure being put into practice is the examination of prisoners now in detention and of suspicious cases as they pass through the court.

A second line of vigorous advance is a civic responsibility concerning prostitution. Not regulation, not segregation, is the accepted policy of this time; nothing less than a strict repression. "In this emergency," stated the mayor of one city to his council, "I think we are justified in going to the very limit of the law, perhaps even a little bit beyond."

And again, because this movement, although begun as a war measure, is of profound social significance, its practical economic aspects are being attentively considered. If as an indication of civic standards of righteousness, prostitution is to be permanently done away; if as a public health measure the chief carriers of venereal diseases are to be detected and cured, then prostitutes must be considered from a new angle—not as outlaws, to be shipped elsewhere as quickly as possible, but as members of the community, to be dealt with by the community. If they are dangerous members, as feeble-minded prostitutes undoubtedly are, provision must be made for their permanent isolation. No less dangerous is the psychopathic individual who is too clever to be easily overtaken by the law, but who may be detected when she comes to a clinic for treatment. For her temporary isolation and medical care must be provided. No less immediate, perhaps even more difficult, is the necessity for giving a fair opportunity to the girl who, under new influences, forms the desire to earn a clean living. Where she is allowed to live, what social life is open to her, what occupation and what pay she can secure,—these are vital questions inseparable from public health that are being faced by divisions of social service in the bureaus of venereal disease now established in six state departments of health.

Since failure at any one of these points can only result in reopening the whole question again, civic, economic, and medical, the program is being based upon legislative as well as educational measures. The common agreement of various communities on this subject must be expressed in proper terms and must carry the proper authority for fulfillment. Such formulation and authority now exist, as has been said, in twenty-one states. It is but fitting that the country whose military and naval regulations for the control of venereal infections in soldiers and sailors are now the strictest of any in the world should enforce, through its civilian population, the proved source of danger, adequate laws to the same end, based on scientific truth, social insight, and civic ideals. G. S.

BREVITY, THE SOUL OF WIT.

The following clipping was taken from a recent issue of *The Survey:*

Have you had a thought that's happy?
  Boil it down.
Make it short and crisp and snappy—
  Boil it down.
When your mind its gold has minted,
Down the page your pen has sprinted,
If you want your effort printed,
  Boil it down.

Many a valuable printed message has been lost to the scientific world because it was hidden in a maze of words that few could and would penetrate.

The verbose author is unfair to the reader because he wastes time and opportunity to get the most from reading; he is unfair to the scientific journal because he wastes expensive space, and makes the journal unattractive; he is unfair to other authors, because he crowds out their contributions; finally, he is unfair to his own writings because he makes them unwelcome.

An article that is three times too long may be only one-ninth as acceptable as the same article properly condensed, for probably only one-third as many people would care to read it, whereas the publication-cost is tripled.

The February 1918, issue of this JOURNAL contains on page 170 a review of a valuable booklet sold for 10 cents by the American Medical Association. It is entitled "Suggestions to Authors." This booklet, or one similar to it, is well worth the study of authors before submitting manuscripts. A. W. H.

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Communication.

February 6, 1918.

To the Editor:

I have just read on page 1004 of the December issue of the AMERICAN JOURNAL OF PUBLIC HEALTH the editorial entitled "The Period After Per Cent."* I am glad to see your journal take this position, because I have fought for it ever since I have had charge of the editorial policy of our three journals and the manufacturing end of this business.

We have followed this style in all of our publications, in fact since the very first issue of the *International Journal of Orthodontia* four years ago, the *Journal of Laboratory and Clinical Medicine* two years ago, and the *American Journal of Syphilis* about fourteen months ago. We have also followed this style in the majority of our medical and dental books, and especially in those that have been published during late years.

In addition, we have adopted a uniform style in many other respects. For instance, we have eliminated the diphthong in such words as "hemorrhage," are using lower case instead of capitals in such words as "x-ray," "rontgenogram," etc., have eliminated hyphens as much as possible, and in many other ways have simplified and Americanized the editorial work of our publishing house.

Yours very truly,

PAUL KNABE,

Manager Manufacturing Department,
The C. V. Mosby Company.

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* This editorial urged omission of the period after "per cent."

THE VITAL STATISTICIAN.

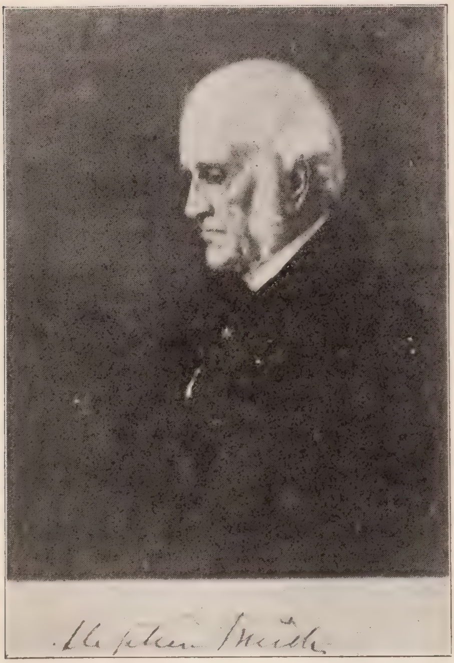
C. E. Terry, M. D.,
Health Editor, The Delineator, New York City.

Another year has gone and with its span
Has robbed, each hour, a home of one beloved,
A mother rendered desolate, a son
Denied a mother's love and watchful care,
A father taken, when his honest wage
Alone defied grim want that ever waits
Expectant, grinning, at the woes beheld.
And here an infant, some fond mother's hope,
All innocent by age, is life denied
Seared ruthlessly while yet the rosy dawn
Of love's sweet rays has scarcely touched his heart.
Page upon page of this great book I turn
And scan its woeful entries, each a line
A scant half-inch devoted to a soul.
A narrow sepulcher indeed this tome
That crowds into its ruling all the hopes,
The love, the work, the life of one once held
A citizen esteemed for his worth,
A number by his name which does refer
To serried index in an oaken file,
And there explains the boundaries of his grave,
The proof the law exacts when life is done.
From these dumb pages, tables I prepare
That show, in neat alignment to their cause,
The numbers claimed by each disease; the toll
To the white plague whose ravages exceed
Each year, the sum of all that die in war.
Then typhoid, born of filthy watersheds,
In ignorance disposed is here brought back
And served upon our tables fair the while:
Pneumonia that sits upon the chest
With choking weight: cancer, the heritage,
An evil heirloom to bequeath our seed
Its fungus roots by some unhappy choice
Seek for their bed the very fount of life,
The mother's breast, as tho' in anxious haste,
They would impart their poisons earliest.
So, down the line, each reason technical
Denotes in facile terms, explains for us
The passage of a soul, but does it deal
With human misery lurking underneath?
Are here set forth the tears, the toils, the aches?
Is here writ down that this man starved and died
Deprived of food when weakened by disease,
Or that another nursed in ignorant love
A friend's last hours and so himself at last
A victim fell? Or does it speak, in truth,
Of that sad waste that's taken from our homes
Each year, an even half of all set down,
From cause preventable, lost through neglect,
Public or private greed or politics?
Are here explained, denoted as should be
The lack of guarding laws that could protect,
In honest hands, the unlettered from disease?
May any search of this bald record show
The sordid ends that struck a toiling life
From off the roll: or how Desire and Gain
In jealous haste paid wearied lives for lust?
The saddest lines of this my table fair
Deal not with age, whose three-score years and ten,
Entitle Death to gather in his fold,
Nor yet with those of such an age to learn
Protection from their ripening store of truth.
Instead, it shows, in pitiful array,
A long procession of our babies gone,
Not trooping joyfully, books in hand, from school,
Their heart's delight at living in their eyes.
No such glad concourse greets us as we gaze,
Instead, are shown the garnering from this
Or that contagion. The placard of such
Disease is worn not on the door alone
Of some afflicted home, but conscience borne
By parent, guardian, physician, nurse,
A moral placard, quarantine, in truth,
That sheds protection wholly and entire
On all around. Again in equal lack
Of wise provision, do we see the toll
Exacted by the heat of summer's suns
And hiving tenement and factory bench,
And that to filth, to spoiling foods, the price
Nature exacts, who would ignore her truths.
Will man pursue his folly to the end
And starve and stunt and dwarf the seed he sows
Scar with disease; with filth and ignorance tend
This pride of all that in God's garden grows?
The last page turned, the last line entered here,
A year's statistics end and start a year.

Association News.

By the Secretary, A. W. Hedrich.

Dr. Stephen Smith, First President of Our Association.—On February 19 an anniversary banquet in honor of Dr. Stephen Smith on his 95th birthday was given by Dr. J. H. Kellogg at the Battle Creek Sanitarium. The medical staff of Camp Custer, almost one hundred in number, the Battle Creek profession, the sanitarium staff, and a fair number of visiting physicians were in attendance.



STEPHEN SMITH, M. D.
First President of the American Public Health Association.

Doctor Smith, the Father of the American Public Health Association, spoke at length reciting incidents in his long life. He called the meeting which organized the American Public Health Association, attended the meeting and was elected president. He was reëlected the next year, serving two terms, but declined election to a third term.

Doctor Smith was health officer in New York City more than fifty years ago. The New York City sanitary code was drawn by him. He was responsible for the provision of the code stating that the execution of health laws could not be enjoined. Doctor Smith has been a member of the American Public Health Association since 1872.

Doctor Smith was introduced by the host of the evening, Dr. J. H. Kellogg. Doctor Kellogg joined the American Public Health Association in 1878, being the fourth member in point of duration of membership. Doctor Kellogg called attention to Doctor Smith's physical and mental vigor ascribing it in great part to his simple habits and plain living. He follows those principles of personal hygiene which all of us advocate.

Another speaker was Doctor Baker, for thirty years secretary of the Michigan State Board of Health. Doctor Baker attended the first meeting of the American Public Health Association at the invitation of Doctor Smith and was one of the earlier presidents.

Dr. W. A. Evans, in bringing the greetings of the American Public Health Association to Doctor Smith, promised that in Doctor Smith's one hundredth year, if we are so fortunate as to have him with us then, we will celebrate in his honor with a meeting devoted to the accomplishments of preventive medicine in the last one hundred years and particularly during the years of Doctor Smith's connection with it.

The average life expectancy of a man in his 96th year, according to Glover's Life Tables, is 2.31 years but any one who knows Doctor Smith's mental and physical vigor would not hesitate to say that he will be in attendance at the fiftieth meeting of the American Public Health Association in the autumn of 1922.

W. A. E.

* * *

What the Religious-paper Man Said.—Recently your Secretary asked for advice on Journal advertising from an expert, the former manager of a religious paper, a man of high ideals and of keen judgment. His answer was as follows:

"You have exactly the problem which I had to face. Soon after I came on the job, I realized that if our paper were to succeed, we would have to induce our members to actively support the advertising. So we organized an advertising committee in each local church and I visited and personally addressed the local bodies. I didn't ask them to accept inferior goods, high prices, and poor service; I merely asked that they read the ads, patronize the advertiser when other considerations were equal, and to *tell the advertiser where they had read the advertisements.*

"Results were astonishing. One of our advertisers actually had to establish a branch on the Pacific coast, although he had advertised in no other medium reaching the West. Another traced a five-thousand-dollar order to one of our readers who had demanded a brand of gloves advertised in our paper.

"As a result of the loyalty of our readers, our paper has been called the best advertising medium of its kind in the country."

There is plenty of *clean* advertising available for the JOURNAL if our members will support the advertising. What we lack in numbers we can make up with enthusiasm and loyalty.

We want to give Association members a great deal more than they are now receiving for a five-dollar membership fee. We also want to begin propaganda for raising salary standards and promoting the public health cause generally.

Will you help to increase our revenue for these purposes by patronizing the advertiser and by mentioning the JOURNAL when writing to him?

If you will do this, why not write us a short note which we can show to the advertiser?

*

The 1918 Membership Drive.—Owing to the energy of our members there was a forty per cent increase in membership during 1915. Details of a 1918 membership drive will soon be announced in the JOURNAL which we hope will more than double our membership before the next annual meeting.

The January, 1918, issue of the JOURNAL gives the present list of members. It is suggested that you prepare a list of your professional acquaintances who are not members, with a view to inviting them to membership.

Further announcements will be made in this column.

*

Cash for Old Journals.—In response to an announcement in the February JOURNAL a number of back issues were forwarded to this office. However, a large number are still needed to complete broken sets. In particular the following issues are wanted:

Transactions of the A. P. H. A. Wanted: Nos. 3, 5, 6, 15, 16, 17, 27, 28, 33, 36, at $1.00 per volume.

American Journal of Public Hygiene. Wanted: Vol. 1–6, at $1.25 per volume.

AMERICAN JOURNAL OF PUBLIC HEALTH.

Vol. I (1911). Issues of April, May, June and November, at 25c. Also complete volumes at $1.25.

Vol. III (1913). Issues of January, August, September and December, at 25c. Also complete volumes at $1.25.

Vol. IV (1914). Issues of September and January at 25c.

Vol. VII (1917). Issues of February, July, and September, at 25c. Do not send the 1917 issues unless some of the foregoing issues can be sent also.

If you have any of these to sell, please write at once to the Secretary at 126 Massachusetts Ave., Boston, Mass.

Medical and public health libraries which desire to install a file of this JOURNAL will do well to apply at once for one of the very few sets now on hand. In a very short time these will no longer be obtainable.

*

Officers and Directors.—A list of these is printed on page XVI of this issue.

HELP WANTED.

Note.—In order to help relieve the shortage of sanitarians due to the war, free help wanted announcements will be carried in this column until further notice. This service supplements, but does not replace the Health Employment Bureau.

Wanted: A chief social worker in a central state in connection with venereal disease propaganda. Beginning salary will not be over $2,400. A woman is preferred if a suitably trained person can be secured. Address F. W. L., No. 107, care of this Journal.

Wanted: Live health officer for thriving town of 8,000 population. Experienced man preferred. State qualifications. Salary, $1,800. Address H. S. Hartzog, Mayor, Greenwood, S. C.

Wanted: An executive secretary for the newly organized Cincinnati Public Health Council. Salary, $2,000 to begin. Address Mr. C. Dinwiddie, care of Cincinnati Anti-Tuberculosis League, 209 West 12th St., Cincinnati, Ohio.

Wanted: A county health officer in a South Atlantic state. Salary, $2,500 to $3,000. Address M. A. W., No. 106, care of this Journal.

Wanted: A statistician for a central state health department. The "M. D." is required. Applicant should be under forty-five years of age. Salary to begin, $2,000. Address H. N. J., No. 105, care of this Journal.

Wanted: Hospital superintendent. The New York State Civil Service Commission will hold, in the early part of April in various cities in the state, examinations for superintendent of the County Tuberculosis Hospitals of Niagara County and Steuben County, at salaries ranging from $1,500 to $3,000 and maintenance; open to male physicians only. Any person who desires to compete for these positions should write at once to the State Civil Service Commission, Albany, N. Y., for detailed circular and application blank.

Wanted: Medical men for administrative positions. Preference in making appointments to men between ages of 25 and 35 with bachelor and medical degrees with a year of hospital or public health work. Beginning with salary of $3,000 with increases to $4,000 and $5,000. Address: F. A. J., No. 64, care of this Journal.

Wanted: In Rhode Island City, person experienced in tuberculosis work for follow-up of cases and coördination of agencies. Tact required. Applications from nurses considered. Salary, $1,200 to $1,500. Address C. V. C., No. 110, care of this Journal.

Wanted: Epidemiologist in West Virginia. Will supervise vital statistics also. Salary, $2,400. Address J. L. S., No. 60, care of this Journal.

Wanted: Trained man for milk and dairy inspection in Maryland City. Salary, $1,200 to begin. Address C. J. M., No. 80, care of this Journal.

Wanted: Medical man familiar with hospital and public health problems for editorial work in Chicago or New York City. Salary to begin, $2,500 or more. Address B. F. O., No. 93, care of this Journal.

Wanted: Chief bacteriologist, Ohio public health laboratory. Halftime research work. State qualifications. Salary up to $2,100. Address V. H. L., No. 109, care of this Journal.

Wanted: A social worker—nurse, for civic and health activities in small industrial city. Should have experience in nursing supervision. Salary ranges from $1,200 to $2,000. Address A. B. D., No. 111, care of this Journal.

PERSONAL NOTES.

Members and subscribers who enter the war service are invited to write the editor a notice for insertion in this column.

⁂

Dr. Allen J. McLaughlin has resigned as Health Commissioner of Massachusetts, in order to become an Assistant Surgeon General of the United States Public Health Service. Dr. Eugene R. Kelley has been appointed to succeed Doctor McLaughlin, beginning April 1, 1918.

⁂

Dr. W. A. Sawyer, Health Commissioner of California, has resigned in order to enter the Army Medical Service. He is succeeded by Dr. W. H. Kellogg.

⁂

Dr. Harold B. Wood, formerly Deputy Commissioner of Health of West Virginia, has been appointed Epidemiologist in the Division of Communicable Diseases of the New York State Health Department. He is stationed at Albany.

⁂

Dr. William F. Wild has been appointed Health Commissioner of Nebraska to succeed Dr. E. S. Tenney, who resigned to enter the Army Medical Service.

⁂

As we go to press, word is received of the decease of Dr. Samuel G. Dixon, Health Commissioner of Pennsylvania. Doctor Dixon has been a member of the Association since 1905, and has long been at the head of the Pennsylvania Department. His demise will be greatly regretted by the public health fraternity.

⁂

Mr. John Hall has been appointed First Lieutenant in the Sanitary Corps, and is stationed at Fort Oglethorpe, Georgia.

⁂

Dr. S. N. Trockey, Chicago, Illinois, has been commissioned First Lieutenant, M. R. C.

⁂

William C. Hoad, Professor of Sanitary Engineering at the University of Michigan, has been appointed a Major in the Sanitary Corps, N. A., and will do work in camp sanitation.

Dr. E. L. Flanagan of Fairfax, Va., has been commissioned in the Medical Reserve Corps with temporary assignment to the Rockefeller Institute.

⁂

Mr. Forrest J. Funk has been appointed First Lieutenant in the Sanitary Corps.

⁂

It is with regret that we learn of the death of Dr. Frank H. Stadtmueller, formerly State Dairy and Food Commissioner of Connecticut.

⁂

Dr. A. W. Akerley, of Newport, Rhode Island, has received a captaincy in the Medical Reserve Corps.

⁂

Miss Helen Jordan, of Boston, has been placed in charge of the bacteriological laboratory at Norfolk, Virginia. She succeeds Mr. H. G. Parker, who has entered the Service.

⁂

Dr. John A. Amyot, of Toronto, is at the front in the Canadian Army Medical Corps.

⁂

We are informed of the death of Dr. D. B. Bentley, of Sarnia, Ontario. Apparently he was either killed in action or died behind the lines.

⁂

Mr. Carlos E. Warriner, of Fort William, Ontario, is in the United States Government service with headquarters at Honolulu.

⁂

Mr. Lawrence P. Geer of Berlin, N. H., is now with the United States Public Health Service at Columbia, S. C.

⁂

Major W. J. Lyster of Detroit, Mich., has received a colonelcy and is to be addressed care of the American Embassy, London, England.

Mr. William Holway of Alliance, Ohio, has removed to Tulsa, Okla. He will be in charge of the new water filtration plant.

⁂

The following have been elected to membership in the American Public Health Association:

Wm. Jay Schieffelin, 5 East 66th St., New York City, Chairman, Joint Board of Sanitary Control.

Louis Holtz, Aberdeen, South Dakota, Public Health Work.

Henry Barton Jacobs, M. D., 11 Mt. Vernon Place, Baltimore, Md.

Harry de Berkely Parsons, 22 William St., New York City, Consulting Engineer.

Karl F. Schmidt, 1201 6th St. N. E., Canton, Ohio, Chief Chemist.

William A. Davis, M. D., Capital Station, Austin.

Sun Life Insurance Co., Pauada, Montreal. Corporate Member. Representatives: Mr. T. B. McCaulay, Pres., and Mr. Arthur Wood, Actuary.

Maurice Zacharias Bair, Columbus, Ohio, Assistant Engineer, Ohio State Department of Health.

Carl Raymond Fellers, 301 South Church St., Charlotte, N. C., Sanitary Bacteriologist and Inspector, U. S. P. H. S.

William F. Roberts, M. D., Main St. and Douglass Ave., St. John, N. B.

Ralph Leland Huttenloch, Nutley, Essex County, N. J., Health Officer.

J. Lewis Amster, M. D., 2055 Bathgate Ave., New York City, Health Commissioner, New York City.

Mae E. Larkin, 623 Clinton Ave., Albany, N. Y., Assistant Bacteriologist, State Department of Health.

William Herbert Bixby, 428 Custom house, St. Louis, Mo., Brigadier General, United States Army, Retired.

Books and Reports Reviewed.

Report of the Surgeon-General, United States Army, 1917.

The Report of the Surgeon-General, United States Army to the Secretary of War, dated 1917, includes the report of the health of the United States Army and National Guard for the calendar year 1916, and the financial statement for the fiscal year ended June 30, 1917.

Only necessarily slight attention is given to the health of the new National Army or of the troops in the United States Army upon the declaration of war on Germany, and the gigantic task of recording such will be left to future annual and special reports. The report states that at the time of writing there were more than 13,000 officers engaged in the work of the Army Medical Corps, and it is believed that at least 24,000 physicians will be included in the personnel of the Army Medical Department when full army strength is attained.

"In this work is included the physical and mental examination and training of recruits, the supervision of the wâter supplies, the inspection of foods to be served, the disposition of wastes, sanitation of cantonments and camps, care of sick and wounded, including proper records of all cases, the operation of field, base, and convalescent hospitals, reëducation of the permanently crippled and the handling of the necessary medical supplies and equipment for all this work."

The total number of hospital beds will be placed on a basis of 25 per cent of the strength of the army.

The general health conditions of the United States Army for 1916 were in all respects satisfactory and particularly creditable in regard to the mobilizations on the Mexican Border and for the Mexican Expeditions. The mean strength of the entire Army, American and native troops, including the National Guard, was 176,803 for 1916. Its non-effective rate from all causes was 24.26 per 1,000 and for disease alone 20.55, both of which rates were slightly lower than for 1915. The death-rate was 4.39, as against 4.45 per 1,000 of mean strength for the previous year.

The non-effective rate, from all causes and from disease, as well as the death-rate of the Regular Army was slightly higher than the above combined rates, and also higher than such rates for 1915, but considerably better than the respective rates of the previous decade.

The total losses of the Army from all causes—deaths, discharges, and retirements was 20.92 per 1,000 for 1916, compared with 18.03 for 1915.

Malarial fevers show a non-effective rate of 0.62 for 1916, as compared with 0.54 for 1915, the lowest rate in the history of the Army. Since 1916, when malarial fevers caused a non-effective rate of 2.55 per 1,000, a marked decrease with but two exceptions has been recorded. Such decrease is in evidence due to antimalarial measures employed.

The highest non-effective rate for disease alone for 1916 was among troops stationed in China—a rate of 28.22 per 1,000—though this rate is lower than for 1915. The non-effective rates of stationed troops are in the following order: United States with 25.51; Canal Zone with 23.45; Porto Rico with 22.53; Philippine Islands with 19.86; Hawaii with 15.23; Mexico with 12.79; Alaska with 6.02.

For 1916 in the entire Army there were only 96 cases of typhoid fever with 5 deaths; 16 cases among the regulars and 71 among the National Guard within the United States; 9 outside.

Triple typhoid vaccine has been adopted for immunization; 410 cases of paratyphoid fever were reported, 95 per cent of the "A" type.

There were reported 1,247 cases of measles for the entire Army, with 9 deaths. Recruiting depots with the resulting congestion are responsible for many of these cases. Many cases of measles also occurred among the highly susceptible material from the Southern rural districts, and many of these cases developed serious complications.

Pulmonary tuberculosis continued to be responsible for disability discharges.

Relative to venereal diseases it is of interest to note that the report flatly refuses to accept the criticism of "well-meaning but ill-informed" critics that illicit intercourse and venereal disease are more common in the military forces than in civil life. This erroneous conclusion results, it is believed, from the fact that statistics of these diseases are collected by the Surgeon-General and frankly published, while in civil communities such statistics are incomplete and inaccessible. The report also holds the laxly governed civil communities responsible for its spread.

Thus in general is described the health of any army. Considerable elaboration is made throughout the report as to special diseases, general sanitation, control of preventable diseases, the working of the various departments such as hospitals and laboratories, and the health at various posts.

Relative to the punitive expedition into Mexico, which averaged 8,343 officers and men, the non-effective rate was 15.41 for all causes, that for disease being 12.79, and for external causes 2.62. The two diseases causing the highest non-effective rate were diarrhea and enteritis, 2.21, and venereal diseases, 2.14. The death-rate for all causes was 7.79 per 1,000, that for disease being 2.28, and from external causes, 5.51. In all there were 65 deaths.

In closing this very general review of a very detailed report, it is of interest to note the various rates prevailing at the U. S. Military Academy, West Point, N. Y. There is included in this report the first sanitary report from this station covering a calendar year. The non-effective rate for the cadets was 14.19 per 1,000. No deaths occurred with the exception of one cadet who developed tuberculosis, and of two others who died while on leave of absence. Of the 663 hospital admissions, 22.92 per cent were for diseases of the digestive system; general diseases furnished the next largest number, 135, or 20.35 per cent, 108 of which were cases of influenza, a result of an epidemic.

The report as a whole, filled as it is with much description, many accurate statistics and tables, is an excellent example of thoroughness and can well claim attention as a hand book of military hygiene. *A. D. Hiller.*

State Sanitation. A Review of the Work of the Massachusetts State Board of Health. *By George Chandler Whipple, Professor of Sanitary Engineering in Harvard University and the Massachusetts Institute of Technology. Harvard University Press, Cambridge, 1917. Vol. I, Pp. 377. Vol. II, Pp. 452. Price $2.50 each.*

The political health officer, who makes of his business a trade and not a profession, will take no interest in these volumes. To the official who does his duty, keeps up with the progress of science and wishes to do his bit to advance it, they will be an inspiration and their perusal a pleasure. A notable institution has found a worthy historian. "State Sanitation" is a broad title to give to the history of the State Board of Health of Massachusetts, but the history of a department, the first in the field and ever progressive, gives a true picture of the growth of state health work in the United States.

The first volume, as indeed will be the case with all three, has two parts. The first, comprising 237 pages, is a most readable and yet critical, history of the department. A suggestive chapter is the one setting forth the cost and the value of the work done. To the reviewer, the most interesting of all is the chapter entitled "Personalia," brief sketches of many of the strong men connected with the department. It is a pleasure to learn that more are promised in the third volume. The author has done wisely to print as the second part of this volume nearly all of Shattuck's Report of the Massachusetts Sanitary Commission of 1850. This first and wonderfully prophetic report is well worth careful study.

The Massachusetts State Board of Health was successful because it ever sought the truth and strove to extend the bounds of human knowledge. Many records of these studies, some of them epoch making, are contained in the reports of the board and the author wisely decided to preserve and make accessible some of the more important by printing them in his second volume. Two-thirds of these articles deal with engineering subjects, which is proper enough, as the best known achievements of the department have been in this field. A large number of abstracts of other articles and reports also appear. There will be indices of the reports of the board and biographical sketches of the leading engineers, chemists and biologists connected with it.

Charles V. Chapin, M. D.

Reëducation. *George Edward Barton, A. I. A Houghton-Mifflin Company, Boston, Mass. 1917. 118 p. Price $1.00 net.*

This sane, vigorous and most readable analysis of the Institutional System of the United States, by George Edward Barton, the president of the National Society for the Promotion of Occupational Therapy, is offered by its author as one of the products of his own disability, since he has himself been confined to hospital and convalescent life for twelve years from various serious causes. His thesis is that "there is necessarily a limit to the amount which the normal man can do for his unfortunate brother and a limit to the number of members of a community who can remain in idleness no matter how distressing their condition. More than that, to support in idleness, even though in distress or pain, is not the best means of assisting the unfortunate."

Mr. Barton feels that the present European war will push this country with all others beyond the point where any country can afford to support its institutional inmates without having them contribute as much as possible toward their own maintenance. This idea has already been utilized in the treatment of delinquents and of sense defectives, and the European war experience has shown its feasibility in the treatment of surgical cases.

"Reëducation" is the means by which disabled soldiers may be made almost wholly self-supporting and already the "3 R's" of reëducation have been found to be drawing, modeling, and mechanics. The interesting statistics, the many practical suggestions and the general business-like tone of this book will make it useful both to the profession and the laity.

Eunice Burton Armstrong.

An Introduction to the History of Science. *By Walter Libby. Houghton, Mifflin Company, 1917. Pp. 288.*

This book is said to be written "for youths of seventeen to twenty-two years of age (and their intellectual compeers)." The modesty of the author in making this statement is somewhat excessive; his clear and thoughtful writing should appeal to a wider circle. The subject is usually treated in one of two ways: either a strict chronological development is attempted or the several branches are followed separately from early to modern times. Professor Libby has found a new way to organize his material and has made each chapter express the relation between science and some particular human interest. The result is admirable. Critical readers may think that Lavoisier is slighted and that Franklin is unduly glorified. But if this is a fault it is easily overlooked in a work which is declared to be an introduction and which cannot fail to stimulate a desire for more extended knowledge.

P. G. Stiles.

Treatment of Infantile Paralysis. *By Robert W. Lovett, M. D. F. Blakiston Son & Co. 2nd edition.*

Doctor Lovett's experience with poliomyelitis during the Vermont epidemic and with the cases of the New York State epidemic of 1916, together with his clinics in Boston, have placed him in a position of great authority as to this disease. In this second edition he has reduced the space given to the diagnosis and increased that given to treatment to such an extent that in the book of 171 pages, all but 26 are devoted to treatment.

It is very difficult for surgeons, especially in clinics, to analyze the paralysis with the care and precision which Doctor Lovett advocates. The time which each case would take would preclude a large clinic being handled successfully, and especially so with the dearth of surgeons due to the number serving the country.

This book contains many tables of statistics. It is difficult to draw unquestionable deductions from statistics, yet this is the only way we can approach facts of scientific value.

We know of no work so concise and so complete on the treatment of poliomyelitis, and in almost every instance the statements made in this book are, we believe, supported by the opinion of the members of the American Orthopedic Association. It will be of value to every physician coming in contact with these cases.

John Joseph Nutt, M. D.

Public Health Notes.

Abstracted by M. E. Champion, M. D., M. P. Horowitz, and R. R. Harkness.

Face Mask.—G. H. Weaver, Chicago (*Journal of the American Medical Association*, January 12, 1918), describes the methods used at the Durand Hospital for Infectious Diseases and the results obtained. Special efforts are made to protect the nurses from infection. The graduate nurses, eight in number, are specially trained to care for contagious cases, but the pupil nurses lack this experience. Of the sixty-nine nurses employed from March 12, 1913, to November 1, 1914, nine, or 13 per cent, acquired clinical diphtheria. Beginning with the latter date, all incoming nurses have been given the Schick test and those reacting positively have received immunizing doses of diphtheria antitoxin, repeated at intervals of three or four weeks during their stay. Since then, only three cases of mild diphtheria have occurred. From other diseases, like scarlet fever, meningitis and diphtheria, the nurses have been protected by the use of face masks made of a double thickness of gauze, which they wear almost continuously when in close association with the patients. These masks are also worn by patients and by physicians when doing incubations, taking throat cultures, and, to a considerable extent, when examining patients. Coincident with the use of the mask, there has been an absence of diphtheria or diphtheria carriers among the physicians and only a limited amount of throat infection. The writer thinks that they could be used profitably by persons caring for pneumonia patients. (*M. E. C.*)

⁂

The Need of Health Insurance.—In the *Public Health Journal* for December, 1917, Irving Fisher urges the adoption of health insurance as the next great step in social legislation in this country. The United States is the only large and progressive civilized country in the world that has not adopted health insurance in some form.

It is believed, however, that health insurance must come soon due to the growing scarcity of labor on account of the war, and the necessity for conserving the labor supply on hand. To this end many forces are at work such as health, social, business and labor organizations. The health insurance bills as introduced in the legislatures of Massachusetts, New York, and New Jersey, provide for compulsory insurance of all workingmen and women. In case of sickness the insured will receive medical or surgical service, medicines, and nursing, and a cash benefit amounting to two-thirds of the weekly wages of the insured for a period of illness up to six months. Maternity benefits are provided for childbirth and funeral benefits for death.

Health insurance will do more to prevent disease and better industrial conditions than almost any other movement. Under a system of health insurance, employers will keep morbidity statistics. They will also furnish better sanitation, ventilation and lighting, more moderate hours of labor, and a fuller consideration of the special needs of women and children. Greater attention will also be given to housing conditions, to the personal hygiene of the worker, and the general health conditions in the community. Thus the span of life will be lengthened and men will not be thrown to the scrap heap at the prime of life. (*M. P. H.*)

⁂

Minnesota Starts Venereal Control.—The Minnesota State Board of Health has organized a Division of Venereal Diseases. The division has been authorized to expend not over $35,000 for the control of these diseases during the coming year.

The director of this division will be Dr. H. G. Irvine, of Minneapolis, who has been in California for the past six months organizing similar work there. Mr. L. W. Feezer, Educational Agent of the Board, will be assistant director of this division. The educational feature of this division will be in charge of Dr. Mabel Ulrich, of Minneapolis, who has had a wide experience in the United States as lecturer on social hygiene subjects.

The plans and budget include social service and protective work for following up and controlling infected cases and for organized effort in the various communities to safeguard young people, and to secure adequate recreational facilities. The necessary laboratory work for the diagnosis of syphilis and gonorrhea will be undertaken under the State Board of Health and funds have been provided for this purpose. Free salvarsan will be provided through health officers and accredited dispensaries and hospitals for the treatment of cases of patients who cannot afford to pay for this drug.

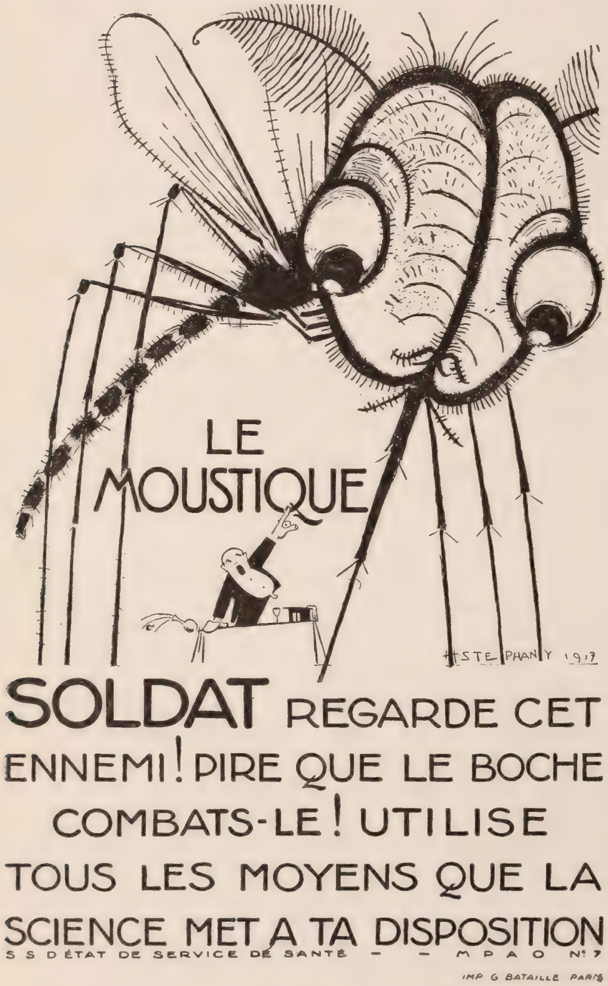
The Board of Health will soon promulgate regulations which have been prepared covering the recording of these cases together with the control and isolation if necessary of those which prove incorrigible or for other reasons constitute a menace to public health.

The Board of Health expects to continue in close coöperation with the Social Hygiene Commission and to rely on its support and advice to carry out its program. The Social Hygiene Commission, in addition to this, will undertake through one source or another to see that the law enforcement committee is financed and put into operation in the shortest possible time.

Negotiations have already been made looking towards more adequate dispensary treatment of syphilis and gonorrhea in Minneapolis and St. Paul.

*

We show in this issue the remainder of the French anti-mosquito cartoons sent by Professor Gunn. Several were published in the January Journal.


LE MOUSTIQUE
H STEPHANY 1917
SOLDAT REGARDE CET ENNEMI! PIRE QUE LE BOCHE COMBATS-LE! UTILISE TOUS LES MOYENS QUE LA SCIENCE MET A TA DISPOSITION
S S D ÉTAT DE SERVICE DE SANTÉ — — M P A O N° 7
IMP G BATAILLE PARIS

TRANSLATION:

Soldier! Look at this enemy. He is worse than the boche. Fight him! Use all of the resources that science puts at your disposal.

Tuberculosis Increasing.—Tuberculosis is apparently increasing in the warring nations, due mainly, it is believed, to restrictions in food supply and undernourishment. This has been recognized in Germany, and England, and now New York City reports the same phenomenon. In England and Wales, the tuberculosis mortality increased 12 per cent in three years since 1913. The increase in deaths from tuberculosis was 1,582 in 1914, 4,621 in 1915, and 4,490 in 1916. In New York City it was recently found that one-eighth of all the school children were undernourished. The article appeared in the *Boston Medical and Surgical Journal* for January 24, 1918. (*M. P. H.*)

◆

Principal Causes of Death.—The following table is compiled from quotations of the Census Bureau Report for 1916, which appeared in the *Boston Medical and Surgical Journal* for January 24, 1918.

During the year 1916, there were reported 1,001,921 deaths in the registration area, which contains approximately 70 per cent of the population of the United States. Heart disease, tuberculosis and pneumonia caused about one-third of the deaths and another third was caused by Bright's disease and nephritis, cancer, apoplexy, diarrhea and enteritis, influenza, arterial diseases, diabetes, diphtheria and typhoid fever.

◆

Venereal Disease in Camps.—According to a report from Surgeon-General Gorgas there were reported from 31 cantonments, 21,742 new cases of venereal disease for a period of twelve weeks ending December 7, 1917. It has cost the government to keep these men during the time of hospital confinement more money than is required to maintain the entire command at Camp Dix (20,859 men).

(*M. E. C.*)

SOLDIER! TAKE YOUR QUININE EVERY DAY.

The Parole.

SOLDAT ! PRENDS CHAQUE JOUR TA QUININE
Le Permissionnaire
S.S. d'ETAT du Service de SANTÉ M.P.A.O N° 10
A. Guillaume
Il a mal pris sa Quinine.
Il a bien pris sa Quinine.

He has neglected his quinine.

He took his quinine well.

War Time Diet and Health.—"At a time when the problem of domestic food supply is peculiarly pressing and when dietetic habits are undergoing enforced changes, the question must be frequently asked whether there is any widespread danger to health in these conditions." Thus writes Dr. Percy G. Stiles in the February issue of the New York State *Health News*.

This is a time when men and women need to be set right on the food question and its relation to patriotic duty, lest individuals impose upon themselves extreme and ill-advised denials.

"We need particularly to cultivate a right mental attitude toward the situation. It is within our power to determine whether we will magnify our privations or find an intellectual pleasure in grasping the problem and watching the process of its solution. We may dwell on the unwelcome restrictions or we may with greater advantage rejoice in the new spirit of coöperation. It is likely enough that the dissatisfaction we are tempted to feel with our daily food arises chiefly from the unhappy undercurrent that is in every mind. The terrible facts of the war are to be resolutely faced, but we shall do well to preserve our mental balance by sane recreation, good reading, and other interests detached from this colossal horror. If we can keep a philosophic temper we can make light of dietetic trammels." (*R. R. H.*)

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Treatment of Carriers.—At Camp Wheeler, Macon, Georgia, according to the *Journal of the American Medical Association*, experiments are being carried out to test the effect of chlorine gas inhalation on the carrier state. These experiments were at first confined to meningitis carriers. The chlorine has seemed to be more effective than dichloramin -T. The use of this prophylactic is to be extended to pneumonia contacts. (*M. E. C.*)

ALWAYS SLEEP UNDER YOUR MOSQUITO NETTING.

The Awakening.

DORS TOUJOURS SOUS TA MOUSTIQUAIRE
Au réveil.
S.S. d'ETAT du Service de SANTÉ M.P.A.O. N°11
Il n'avait pas de Moustiquaire.
Il a bien dormi sous sa Moustiquaire.
Guillaume
PARIS

He had no netting. He has slept well under his netting.

Cancer Decalogue.—The following Cancer Decalogue was recently prepared by the Standing Committee on the Control of Cancer of the Massachusetts Medical Society for publication in the Boston *Medical and Surgical Journal*:

1. The classical signs of cancer are the signs of its incurable stages. Do not wait for the classical signs.

2. Early cancer causes no pain. Its symptoms are not distinctive but should arouse suspicion. Confirm or overthrow this suspicion immediately by a thorough examination and, if necessary, by operation. The advice "Do not trouble that lump unless it troubles you" has cost countless lives.

3. There is no sharp line between the benign and the malignant. Many benign new growths become malignant and should therefore be removed without delay. All specimens should be examined microscopically to confirm the clinical diagnosis.

4. Precancerous stage. Chronic irritation is a source of cancer. The site and the cause of any chronic irritation should be removed. All erosions, ulcerations, and indurations of a chronic character should be excised. They are likely to become cancer.

5. Early cancer is usually curable by radical operation. The early operation is the effective one. Do not perform less radical operations on favorable cases than you do on unfavorable ones. The chances for a permanent cure are proportionate to the extent of the first operation. Make wide dissections; incision into cancer tissue in the wound defeats the object of the operation and leads to certain local recurrence.

6. Late cancer is incurable, though not always unrelievable. Radium, X-Rays, ligation, cautery, or palliative operations may change distress to comfort and may even prolong life.

7. Cancer of the Breast. All chronic lumps in the breast should be removed without delay. Benign tumors can be removed without mutilation. Examine all specimens microscopically. An immediate microscopical examination is desirable since, if positive, it permits a radical operation at the same sitting. A radical operation performed ten days after an exploration is almost never successful in curing Cancer of the Breast.

8. Cancer of the Uterus. Any irregular flowing demands thorough investigation. Offensive or even very slight serous flows are especially suspicious. Curette and examine microscopically. Amputate all eroded crevices which do not yield promptly to treatment. Do not wait for a positive diagnosis.

9. Cancer of the Digestive System is difficult of early diagnosis and therefore unfavorable in prognosis. All persistent and recurring indigestions (more especially if attended by change of color and loss of weight) and any bleeding or offensive discharges demand prompt and thorough investigation. Do not wait for a positive diagnosis.

10. Cancer of the Skin. Any warts, moles or birthmarks which enlarge, change color, or become irritated should be removed promptly. They are likely to become cancer. Do not wait for a positive diagnosis.

This Decalogue is an admirable summary of the whole subject and it is recommended by the Cancer Society to all medical journals for publication as often as possible.—*Indiana Monthly Bulletin.* (*R. R. H.*)

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Infant Mortality Among Negroes Reduced.—The high infant mortality in the Columbus Hill District, New York City, largely populated by negroes, has long been a subject of concern to the health department, and in the summer of 1916 intensive efforts were made to see if this high death-rate among infants could be reduced. The department of health now publishes comparative statistics of the death-rate in 1915 before special efforts were directed to this district and for 1916, when an active campaign for the betterment of conditions surrounding infancy was being carried on.

The comparative death-rates per thousand births follow:

	1915	1916
Congenital causes	125.5	43.9
Respiratory causes	79.5	47.6
Diarrheal diseases	71.1	47.6
Infectious diseases	37.1	43.9

(*M. E. C.*)

✠

Household Sanitation Prize.—North Carolina has a county which is setting a good example to other rural counties in encouraging public health and thrift at the same time. Northampton County health department, according to the North Carolina State Board of Health, is offering $130 in Federal Thrift Bonds to the winners of a contest to be judged on a basis of improvements in home and school sanitation. According to the rules laid down, 500 points out of a possible 1,000 are allowed the child who has a sanitary well and privy at his home, has his home screened, uses a toothbrush and an individual cup at school, and who has been vaccinated against smallpox and typhoid, and examined for hookworm. The school winning first prize must have sanitary toilets, a safe water supply, proper light and ventilation, playgrounds, individual drinking cups, and must give proper attention to the health conditions of the pupils.

⁂

Housing In War Time.—In a pamphlet entitled Housing Betterment, issued by the *National Housing Association* in December, 1917, there appears a review of the serious housing conditions that have come about in many cities, on account of the war. Mr. Robert W. de Forest, President of the National Housing Association, appointed a committee of experts consisting of Grosvenor Atterbury, John Nolen and Lawrence Veiller, to investigate the conditions. The committee urges that a Federal Housing Administration be established, that a housing administrator be appointed at once to have direct charge of the housing of the workers in the war industries of the country, that the President be empowered by Congress to loan money to employers of labor in war industries for the purpose of providing good housing conditions, that the President be empowered to build houses, for sale or rent, to buy or condemn land and to take all necessary steps for the development of communities in which workers in war industries are to live. (*M. P. H.*)

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Sickness Surveys.—The first sickness survey conducted by the Metropolitan Life Insurance Company was made in Rochester, N. Y. The work was then extended and similar studies were conducted in North Carolina, Boston, Mass., and the Chelsea district of New York City. The company has just issued a report on the *Sickness Survey of Principal Cities in Pennsylvania and West Virginia*, which is the Sixth Community Sickness Survey. The authors are Dr. Lee K. Frankel and Dr. Louis I. Dublin. A separate report is made on the sickness survey of Pittsburgh, Pa.

In the general report, the health status of 374,001 persons was obtained by the company's agents. The agents were asked to record only serious cases of sickness. They discovered 7,333 cases, making the sickness rate 19.6 per 1,000.

It was found that sickness was responsible for the loss of at least 2 per cent of the effective working time of the wage earners. This causes not only loss of wages but frequently is a source of misery and destitution. Of the 7,333 persons reported ill, 6,908 or 94.2 per cent were unable to work, and 5,384 or 73.4 per cent had a physician in attendance, 25 per cent of the sick were in bed at home, 8.2 per cent were in hospitals, and 61 per cent were ambulant cases, unable to work. Those sick, yet able to work constituted 5.8 per cent.

Accidents and injuries were the chief cause of sickness in this survey, amounting to 602 cases or 11.2 per cent. Then came "rheumatism" which amounted to 433 cases or 8.0 per cent. "Rheumatism" probably refers to such diseases as neuritis, tuberculosis, gonorrheal and post-traumatic diseases of the joints, bones, and muscular system and function neuroses. Influenza caused 392 cases of sickness; pneumonia, 307 cases; diseases of the stomach, 183 cases; functional disorders of the nervous system, 181 cases; tuberculosis of the lungs, 180 cases; colds, coryza and rhinitis, 166 cases; bronchitis, 156 cases; normal childbirth, 125 cases. There were other causes of sickness such as asthma, diseases of the heart, tonsilitis, appendicitis, cerebral hemorrhage, apoplexy and paralysis.

(*M. P. H.*)

Industrial Hygiene and Sanitation.

Abstracts prepared by DRS. E. R. HAYHURST, R. P. ALBAUGH and P. M. HOLMES.

One Hundred Dollar Prize for Industrial Medicine Thesis. The American Association of Industrial Physicians and Surgeons offers a prize of $100 for the best thesis on any subject related to Industrial Medicine and Surgery by any undergraduate medical student of the United States.

The thesis must not contain more than 5,000 words.

All theses must be in the hands of the Secretary of the Association by May 1, 1918.

Address Harry E. Mock, M. D., Secretary, 122 S. Michigan Ave., Chicago, Ill.

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The First Annual Report of the Council of National Defense, just issued, from Washington, shows the organization and the memberships and purposes of various committees. Among these the Sectional Committee on Sanitation with its various subcommittees, which have been in session for many months, is about ready to make reports upon standards in industrial hygiene and sanitation, particularly as these concern the manufacture of munitions. The first series of reports will deal particularly with the manufacture of explosives and the loading of projectiles. Dr. Wm. A. Evans is chairman of the Section on Sanitation.

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The Eight-Hour Day vs. the Ten. Experiments in Wisconsin factories showed that it was possible, in connection with women employes, to do as much work in an eight-hour day as in a ten-hour day. This was largely due to the fact that time losses of defensive or protective character instinctively practiced by the operators to ward off the accumulation of fatigue were much less in the shorter workday. The report discusses progress in connection with some eight or ten other studies in industrial hygiene which will be reported as they are completed. *Annual Report, U. S. Public Health Service,* 1917.

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Eye Hazards in Industrial Occupations. The National Committee for the Prevention of Blindness, 130 E. 22d St., New York City, will furnish a synopsis of the above publication, which can be used as a basis for lectures and it also announces that it has a collection of lantern slides available which will be loaned with the synopsis without charge. The lantern slides may also be purchased at cost. The report discusses typical cases of eye afflictions encountered in the survey of industries in Buffalo, with recommendations for safe practices. A large number of industrial processes were found to be hazardous to the eyes. There is an excellent chapter on illumination. The report is well arranged and replete with illustrations.

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Workmen's Compensation Insurance in the United States, *Bulletin, Ohio Industrial Commission,* Vol. IV, No. 13. This bulletin, prepared by Emile E. Watson, Actuary of the Ohio Industrial Commission, claims that state to be the largest carrier of this form of insurance in the United States. Since the inception of the fund, July 14, 1911 to May 15, 1917, the total losses of subscribers to the fund have been $12,967,486.92,—the cost of state administration amounting to $1,101,406.51. The earned premium for 1917 is approximated at $8,000,000 with a total cost of administering, $312,279.30. A multitude of permanently disabled workmen, widows and children are dependent upon this state insurance. The bulk of the report, which consists of 93 pages, is a table of rates per $100 of payroll, arranged alphabetically by industries and comparing the costs of 1917 with those of 1912 as well as with the cost of similar insurance in nine other leading states.

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Review of Labor Legislation of 1917, American Association for Labor Legislation, 121 E. 23d St., New York City. This review synopsizes the many advances made during the year 1917 in legislation looking toward the betterment of working conditions in various states such as the reduction of hours, the institution of rest periods and a great mass of legislation under the head of safety and health. A valuable topical index by states of the labor laws enacted is found in the last 12 pages.

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Second Pan American Scientific Congress. The eleven massive volumes constituting the proceedings of the meetings held in Washington December 27, 1915 to January 8, 1916, have just been issued. The various papers are given in their original languages, Portugese and English principally. In the two volumes devoted to public health and medicine are "Legal Protection of Female Wage-earners," by John B. Andrews; "Factory Sanitation," by E. R. Hayhurst; "A Contribution to the Study of Artificial Illumination," by James D. Gatewood, and "Fresh Air and Ventilation in the Light of Modern Research," by C.-E. A. Winslow, these papers comprising from three to fifteen pages each. The papers are detailed and rather too extensive for review in this place.

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Among the papers included in Vol. V (year 1917) of the *Studies from the Otho S. A. Sprague Memorial Institute, Chicago University,* that by Maud Slye, Harriet Holmes and H. Gideon Wells shows that in all animals except man, cancer of the stomach is extremely uncommon both as recorded in a review of the entire literature and in the 16,500 mice autopsied by these workers. Cancer of the intestines is also very rare in mice. "The significance of man's susceptibility to carcinoma of the stomach is not yet known, but probably it depends on the heat of his food or the condiments employed in seasoning it or on the chemical changes produced by cooking." Ada Arlitt and Wells studied the effect of alcohol upon the reproductive tissues of rats and found that their experimental observations harmonize with the findings in human alcoholics in that there is a marked degeneration in the testicles with all possible degrees of abnormality and deficiency in the spermatozoa with their possible relations to the production of defective offspring. No other tissue was found to be noticeably affected by the alcohol; especially to be remarked is the absence of cirrhosis or fatty infiltration in the liver. Helmholz and Rappaport studied the effects of chilling on the production of certain forms of Bright's disease (pyelonephritis) in rabbits, finding that in a series of twenty injections of colon bacilli followed by chilling, about 25 per cent showed focal disease in the kidney as compared with 12 per cent of those receiving like injections but not submitted to chilling.

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New Test for Lead Poisoning. Robert Craik, in a memorandum to the *British Medical Journal,* November 17, 1917, p. 650, states that by producing a punctate basophilia artificially in a painter who believed himself to be suffering from lead colic and in whose blood this cardinal sign was absent, he was able to produce evidence that the man was not suffering from lead poisoning. Craik had previously observed that by treating eight suitable cases—diarrhœa, hemorrhage, etc.—with lead acetate after the manner of an older generation, he found that in seven, punctate basophilia appeared on the third to the seventh day of treatment. When he did not find basophilia in the painter he gave him a few doses of lead and on the fourth day observed the distinctive sign. He then stopped the medicine immediately without any bad result whatever. He infers, therefore, that the man could not have been suffering from lead poisoning originally since his blood reacted in a normal manner when lead was given to him.

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Physiological Hygiene at Johns Hopkins. In the preliminary announcement of the School of Hygiene and Public Health, to be opened in October, 1918, at Johns Hopkins University, the course in physiological hygiene, under the direction of Dr. Wm. H. Howell, is to include subjects of fundamental importance to the industrial hygienist. A series of lectures and laboratory work will be devoted to air and ventilation, heat regulation, light, and exercise and fatigue.

⁂

Ohio Health and Old Age Insurance Commission. In general, the industrial hygienists look to some form of insurance against sickness as the best remedy for bad industrial hygiene, feeling that such insurance would at once stimulate preventive measures greatly. Mr. John Lapp, director of the Ohio commission investigating this subject, presents a tentative outline of the scope of the commission's work in the *Ohio State Medical Journal,* February, 1918, pp. 95–96. He contemplates a study of the state's occupational mortality, the economic loss by sickness and preventable deaths to workers, employers and the public, the fixing of the blame for industrial sickness, a study of the reports of occupational diseases on file with the State Department of Health, and the agencies at work in the state to contravene the losses occasioned, as well as the proper distribution of the burden.

Gasoline Motor Exhaust Pipes Must be Large Enough. The Division of Industrial Hygiene of the Ohio State Department of Health points out, in the *Ohio Public Health Journal*, December, 1917, p. 539, that the attaching of rubber hose connections to motor exhausts in commercial garages and automobile factories, where a number of engines are running at the same time, and attaching these hose to a single 2-inch pipe directed to the outdoors is not at all sufficient to prevent carbon monoxide poisoning of workers. In one instance, of 75 men working under these conditions, practically all had symptoms of carbon monoxide poisoning.

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Safe Operation of Gasoline Engines in Mines. R. H. Kudlich and E. Higgins, *Technical Paper 174, U.S. Bureau of Mines.* Gasoline engines are used about mines for pumping, haulage and driving hoists. Ventilation is usually poor and these engines menace both the health and safety of workers. Gasoline vapor is heavier than air and, unless disturbed by air currents, will flow along the ground like a stream of water. The most dangerous component of the exhaust gas is carbon monoxide, of which 1 part in 500 of air causes severe symptoms. It has been found that one engine may generate as much as 0.45 cubic feet of carbon monoxide per rated horse power per minute. To turn the exhaust into water is useless as carbon monoxide is practically insoluble in water. The precautions for minimizing the risk of fires, the danger of explosions and the health dangers are summarized. The latter are: 1. Set the carburetor, or mixing valve, to give as lean a mixture as will run the engine. 2. Pipe the exhaust gases out of the engine room. 3. Do not work or even stand near the end of the exhaust pipe when the engine is running. 4. Do not try to purify the exhaust by turning it under water. 5. Unless the ventilation in the place where the engine is used is ample and positive, pipe the exhaust gases to some point where there is such ventilation, or pipe them to the surface.

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Trinitrotoluol. Surgeon J. W. Schereschewsky, in *Reprint No. 434 of the Reports of the U. S. Public Health Service* (Washington), discusses practical points in the handling of trinitrotoluol in such a way as not to endanger the health of the workers. The compound can only be handled with safety provided strict attention is paid to a considerable number of details, each of which is perhaps but a small component factor in the defense, the integrity of which, nevertheless, depends upon its unbroken front. The channels of poisoning are through the skin and the respiratory tract. The substance, in either dust or melted form (as fumes), is poisonous. A small amount is almost certain to be absorbed by workers and the point is to keep this absorption well below the minimum poisonous dose. The chief danger comes in the loading of shells with the substance where also a large number of workers are involved. The precautions include care in the planning and construction of work rooms, the separation of processes, the conveyor systems, the melting, casting, pouring, splashing and recessing of the substance, and the sanitary precautions on the part of the workers. In addition, except in an emergency, no person should work with the substance longer than eight hours a day and workers should be rotated at least once in two weeks, while medical supervision must be under the eye of a competent physician who is familiar with the peculiarities of this poison and is given authority to transfer or lay off workers who show symptoms. He should make frequent rounds of inspection through the work rooms, noting particularly the appearance of the workers and requiring doubtful cases to report to the works' dispensary.

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Blindness from Dilute Wood Alcohol. J. M. Robinson, *Journal, A. M. A.*, January 19, 1918, pp. 148–149. Unexplained optic nerve degeneration should make a physician think of the possibility of wood alcohol poisoning. Robinson's blind patient was a Greek of good physique, aged 29, who after two or three hours' work a day for five or six weeks in dyeing hats with a commercial product called "Colorite," noticed failing eyesight which in a few weeks went on to blindness. Analysis of the substance made at the Hygienic Laboratory, disclosed 4 per cent wood alcohol. A résumé of the literature on similar happenings is given.

⁂

Vocational Skin Diseases and Compensation. H. E. Alderson, *Journal, A. M. A.*, January 12, 1918, pp. 71–74. This article deals particularly with the diagnosis of skin troubles in workers due to other causes than work, and presented by workers for claims both honestly and while malingering. Increased sensitiveness on account of digestive disturbances, cases aggravated by bad treatment, cases in persons with naturally susceptible skin and unusual industrial cases such as among stevedores, rice workers and wood workers, all have to be distinguished. With physicians, as well as laymen, the impulse to use strong remedies is only too compelling. A dermatitis requires the most soothing treatment at first.

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Women are as Strong as Men. C. D. Mosher and E. G. Martin, *Journal, A. M. A.*, January 19, 1918, pp. 140–142. The authors studied forty-five average, healthy college women in order to gain exact information concerning the muscular strength of woman, a point which they think should be settled forthwith because of the necessity of mobilizing woman-power as well as man-power in the present world war. They conclude that "there is no difference in the muscular strength of women and men which is due to sex as such. Such differences as are frequently found are due to differences in the use of the muscles, brought about by conventional limitations of activity or by dress." Also that "there is no reason why the potential power of woman may not be used without danger of lessening her racial efficiency."

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Blood of Workers in Trinitrotoluene. L. H. Smith, *Journal, A. M. A.*, January 26, 1918, pp. 231–232. In twenty-five workers much exposed to the substance in question in finely powdered form, a majority of whom had been at work for five months or longer but none of whom was considered sick at the time of the examination, Smith found for the most part negative blood findings and certainly nothing characteristic.

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Injurious Effects of High Heels. The abstract of this paper in a French journal as made in the *Journal, A. M. A.*, January 26, 1918, p. 272, should be read by all who have any misgivings as to the truth of the injurious influence of high heels on physiologic processes, including the attitude and gait of the human body as well as many seemingly incurable signs and symptoms.

How Much Dust is Dangerous? E. R. Hayhurst, *100% Efficiency Magazine*, February, 1918, p. 80. All air contains dust, the amount of which may be surprising when estimated by the usual dust-counting methods. Hence, to specify "air free from dust" is not strictly correct or possible. This natural dust probably acts as the normal stimulus to the ciliated membranes of the respiratory tract. It constitutes the "beneficent dust." The harmfulness of a given dust depends upon: 1. Who you are (respiratory tract and skin in particular); 2. Its solubility; 3. Its poisonous qualities; 4. The density or hardness of the individual particles; 5. The shape of the particles; 6. Its hydroscopy; 7. Its diffusion in the breathing passageways (irritating dusts such as emery or sand having limited diffusion, while bland dusts such as coal having great diffusion); 8. The presence or absence of germs in the dust; and finally, and probably least important, the amount of the dust itself. Dust may be easily visible (as pointed out by Palmer and Whipple), due to the large size of the particles and not to the number present. Hence the mere appearance of the air of a space affords little or no criterion.

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Treatment of Anthrax. G. D. Dudley, *Journal, A. M. A.*, January 5, 1918, pp. 15–17. The author gives an excellent description of localized anthrax infection as it gradually develops. He states that anthrax is not always fatal. When treated properly, few, if any, patients die. The bacillus itself is not difficult to destroy but its spores are among the most resistant known. However, the spore does not form in animals' blood. Three methods of treatment are described: 1. By excision after previous preparation with 8 per cent phenol. Afterwards painting with pure phenol followed by absolute alcohol and a wet dressing. 2. When excision fails, injecting more 8 per cent phenol, and incising freely, inserting gauze drains and applying an ice bag. 3. Use of anti-anthrax serum furnished by the U. S. Bureau of Animal Husbandry, Washington, D. C. Stimulating treatment is used in conjunction.

Public Health Laboratory Notes.

Abstracted by ARTHUR LEDERER, M. D.

APPARATUS AND TECHNIQUE.

Some Substitutes for Platinum Ware.—Results are reported showing loss on ignition in a Bunsen flame for thirty-two hours and solubility in concentrated hydrochloric acid and concentrated sulfuric acid for thirty minutes at 18.5 C. of crucibles made of platinum, gold, silver, wrought nickel, spun nickel, fused quartz, and "composition" (1 part "canadium," 1 part palladium, 2 parts platinum, 6 parts nickel). Solubility in concentrated nitric acid is reported for all of above except nickel. The author recommends the "composition" ware which has a melting point of about 157° C. and is not readily attacked by any similar acid (nitric acid attacks it most). It is attacked by the halogens.—R. F. Heath, *Met. Chem. Eng. 17, 666–7 (1917)*; *Chem. Abstr. 12, 244 (1918)*.

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A New Portable Hydrogen Sulfide Generator.—The new generator is quite light, practically in one piece, self-adjusting, made in size adapted to most analytical work and easy transportable. The construction allows one to use all of the acid added to the generator and permits complete renewal of the acid in a very short time. The apparatus is made up by Eimer and Amend, New York City.—W. Faitoute Munn, *Jour. Ind. Eng. Chem., 10, 130 (1918)*.

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The Nomon—a Calculating Device for Chemists.—The "nomon" is a calculating chart, with a degree of precision from five to ten times that of an ordinary ten-inch slide rule, by means of which it is possible to multiply, divide, square, cube, and to extract square and cube roots with an average error of about one unit in the fourth place. Its employment in chemical practice is illustrated by examples.—Horace G. Deming, *Jour. Am. Chem. Soc., 39, 2137 (1917)*; *Jour. Chem. Soc. London, 112, 567 (1917)*.

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Use of Textile Fibers in Microscopic Qualitative Chemical Analysis.—Silk fibers, previously treated with ten per cent sodium hydrate solution for two hours at the ordinary temperature and then washed, are dyed with concentrated litmus solution, washed, treated with very dilute acetic acid solution or sodium hydroxide solution, and again washed. Fibers thus prepared form very sensitive indicators for the detection of acids or alkalis in minute drops of solution. In testing a drop of solution the fiber is so placed that a part of it is not moistened by the solution, and this part serves for comparison when the drop is observed under the microscope. The litmus used in preparing the fibers must be purified.—E. M. Chamot and H. I. Cole, *Jour. Ind. Chem., 9, 969 (1917)*; *Jour. Chem. Soc. London, 112, 576 (1917)*.

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Automatic Water Level for Arnold Sterilizers.—Experienced technicians, and untrained students, alike err occasionally in allowing Arnold sterilizers to burn dry, involving rapid depreciation of the apparatus. An arrangement is described whereby 175 different persons use a group of twelve connected sterilizers with absolutely no required attention on their part to the water supply.—Ivan C. Hall, *Jour. Bact., 3, 7 (1918)*.

BACTERIOLOGY AND PATHOLOGY.

An Experimental Investigation of Lipovaccines.—The preparation of lipovaccines has so far received little or no attention in this country. It is rather curious that the obvious expediency of preparing bacterial vaccines in a vehicle less rapidly absorbed than physiologic sodium chlorid solution has been completely ignored in the technic of vaccine work. Among the advantages derived from the use of oil vaccines may be considered: (a) the diminution of both the local and the systemic reaction; (b) the feasibility of giving sufficient vaccine at a single injection properly to immunize the individual; (c) the persistence in the individual of a focus from which the immunization proceeds over a period of several months with a resulting lengthening of the period of immunity; (d) the actual detoxicating effect of certain lipoids that can be incorporated in the vaccine, and (e) the prevention of autolysis and deterioration of the vaccine. The authors carried on experiments with typhoid, paratyphoid, pneumococcus, meningococcus and dysentery vaccines. The production of these vaccines is, of course, more laborious and expensive. Apart from the typhoid—paratyphoid A and B preparation, the pneumococcus and meningococcus vaccines have been of interest because of the apparently ready response in agglutinins of both animals and man to a single injection. Whether such a response properly portrays the protective value of the vaccine is, of course, not to be determined in so short a period of time as has been available to the authors. Protection tests in animals vaccinated with the triple typhoid lipovaccine have indicated the development of a considerable degree of resistence, and similar experiments carried out in mice following pneumococcus vaccination gave some evidence of protection.—E. R Whitmore, and E. A. Fennel and W. F. Peterson, *Jour. Am. Med. Assn., 70, 427 (1918).*

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Type Determination of Pneumococcus Infection.—The clearly demonstrated beneficial results in the use of Type I serum for the treatment of cases of lobar pneumonia infected with Type I pneumococcus has led to the introduction in the hospitals of the United States Army of type determination as a part of the routine treatment of cases of lobar and broncho-pneumonia. The author describes the Avery method as used by him in one of the base hospitals. The method outlined is to be recommended on account of its simplicity, reliability and rapidity of execution.—Warren T. Vaughn, *Jour. Am. Med. Assn.*, 70, 431 (1918).

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Determination of the Type of Pneumococcus in the Sputum of Lobar Pneumonia.—As a result of the observation that a boiling alkaline hypochlorite solution would not destroy the precipitable substance of bacteria, the authors developed a rapid method for the preparation of a concentrated precipitin antigen from bacteria. The same method was found to be applicable to the preparation of a precipitin antigen from pneumonia sputum. In an appreciable proportion of specimens the type of pneumococcus present could be identified by this method in from one-half to one hour after the receipt of the sputum. The technique is briefly as follows: From 3 to 10 cc. of the sputum is poured from the sputum container into a test tube. This is placed in boiling water for several minutes or longer. The coagulum is then broken up with a heavy platinum wire or glass rod and saline is added. Just enough saline should be added so that, on subsequent centrifuging, there will be sufficient fluid to carry out the test. In some instances little or no saline is necessary. After the addition of the saline, the tube is again placed in boiling water for a few minutes to extract the soluble antigen from the coagulum. The broken clot is then thrown down by centrifuge, and the clear supernatant fluid used for the test. Two-tenths cc. of the three "type" serums are placed in narrow test tubes, and the antigen added from a capillary tube with a rubber teat. If the tubes containing the serum are tilted and the antigen dropped slowly on the side of the tube just above the serum, no difficulty will be encountered in obtaining sharp layers. The tubes are then placed in the water bath at from 50 to 55 C. and observed after several minutes. If a fixed type was present in the sputum, and should the sputum have been rich in antigen, a definite contact ring is seen in the tube containing the homologous serum. With sputums less rich in antigen, the ring may develop more slowly. The success of the test depends on the quality of the sputum submitted. It would seem that the rapid method, checked by the Avery method, would suffice for the majority of specimens if they are satisfactory in quality. The only necessity of mouse inoculation would be when both give no reaction with type serums, or when the specimen is obviously unsatisfactory for the foregoing methods.—Charles Krumwiede, Jr. and Eugenia Valentine, *Jour. Am. Med. Assn.*, 70, 513 (1918).

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Brilliant Green for Purification of Vaccine Virus.—The data presented by the authors in this article show that brilliant green has little, if any, influence on the potency of vaccine virus, and added to the present glycerolcarbolic preservative, gives a more efficient and more rapidly bactericidal preservative.—C. Krumwiede, Jr., F. S. Fielder and T. A. Watson, *Jour. Infect. Dis.*, 22, 118 (1918); *Jour. Am. Med. Assn.*, 70, 570 (1918).

Globoid Bodies in Epidemic Poliomyelitis.—The authors record the isolation from human and monkey poliomyelitic material of four different strains of an organism which morphologically and culturally agrees in every particular with the descriptions of the globoid bodies of Flexner and his associates. It was observed that the macroscopic appearance of tubes of kidney-ascitic fluid medium which contain good growths of this organism differs from that of the uninoculated control tubes to such a slight degree that often inspection of the tube alone is of no value in determining the presence or absence of a growth.—G. D. Heist, M. S. Cohen and J. A. Kolmer, *Jour. Infect. Dis.*, 22, 169 (1918); *Jour. Am. Med. Assn.*, 70, 570 (1918).

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The Occurrence of a Positive Intracutaneous Reaction in Meningococcus Carriers.—The preparation of the "meningococcin" used in these experiments was made as follows: Pure cultures of five of the six strains chosen as representative of the meningococcus group were grown on one per cent starch agar without peptone for forty-eight hours in ordinary slant tubes. These separate cultures were suspended in sterile saline solution, to each tube 3 cc. The suspended cultures were mixed and three volumes of absolute alcohol added. The organisms were flocculated at once and were rapidly centrifugalized, the supernatant fluid removed, and the bacterial deposition thoroughly shaken in the original volume of fresh absolute alcohol. Recentrifugalization, removal of alcohol, and resuspension in ether were performed. After recentrifugalization and decantation, the sediment was dried two days in partial vacuum over sulphuric acid. The hard, dried sediment was ground to an impalpable powder in an agate mortar and dried again for twenty-four hours as before. This preparation was then suspended in physiologic sodium chlorid solution containing five-tenths per cent phenol. The dose employed in the intradermal tests was 0.05 cc. containing 1/150 mg. of the dried meningococcus powder. The test is applied similar to the Schick test. Readings of the reaction were made at the six hour, twenty-eight hour and forty-eight hour periods. A positive reaction consists in a well demarcated areola of from 3 to 7 mm. which is distinctly indurated. This reaction was found positive between two and three times as frequently in those classified by bacteriologic examinations as positive when compared with those classified negative. The findings are presented with all reserve as to their significance. Whether this reaction would serve a diagnostic purpose in the detection of meningococcus carriers must only be suggested for future investigations.—Frederick P. Gay, and A. J. Minaker, *Jour. Am. Med. Assn., 70, 215 (1918).*

✤

The Value of the Wassermann Reaction.—Depending on the antigen employed, the Wassermann reaction in the living patient, as carried out at Bellevue Hospital in New York City gave a negative result in from thirty-one to fifty-six per cent of cases in which the characteristic anatomic signs of syphilis were demonstrable at necropsy. The Wassermann reaction in the living patient was positive in at least thirty per cent of cases in which it was not possible to demonstrate any of the anatomic lesions of syphilis at necropsy.—Douglas Symmers and C. G. Darlington, and Helen Bittman, *Jour. Am. Med. Assn., 70, 279 (1918).*

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The Use of Microörganisms to Determine the Preservative Value of Different Brands of Spices.—Molds, yeasts and bacteria show a marked variation in sensitiveness to different brands of spices. The amount of growth of such organisms in a given time on media containing spice may be used as a means of determining the relative preservative values of the different brands of the spice. Species of molds, yeasts and bacteria were grown on nutrient agar containing varying amounts of spice. Tabulated results are given. Five brands of cloves, three of cinnamon, and three of allspice were employed. The results show that there is considerable variation on the preservative value of the brands used and that the growth of microorganisms on a spice medium may be used as a criterion of the preservative value of the brand of the spice.—Freda M. Bachmann, *Jour. Ind. Eng. Chem., 10, 121 (1918).*

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Disinfection with Formaldehyde—A Substitute for the Permanganate-Formalin Method.—The author proposes potassium chlorate as a substitute for permanganate. A proportion of 25 gms. of chlorate to 100 cc. of formalin is recommended. The process is much cheaper than the permanganate process.—C. G. Storm, *Jour. Ind. Eng. Chem., 10, 123 (1918).*

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The Inhibitive Effect of Ox Bile on B. Typhosus.—The recorded observations show that a great number of the viable cells of B. typhosus are affected through the use of bile media, and further multiplication prevented. Bile has a distinctly inhibitive effect on the growth of typhoid bacilli. This inhibition can be reduced to a certain extent by the addition of glycerol. Bile salts distinctly retard the growth of typhoid bacilli.—Enrique E. Ecker, *Jour. Infect. Dis., 22, 95 (1918).*

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An Aerobic Spore-Forming Bacillus Giving Gas in Lactose Broth Isolated in Routine Water Examination.—An aerobic bacillus, giving gas from lactose, and demonstrated to be spore-forming, has been isolated eight times from the tap water of Newport, Ky. This organism is believed to be a species whose isolation has never before been described.—E. M. Myer, *Jour. Bact., 3, 9 (1918).*

CHEMISTRY.

Urge Laboratories for Every Waterworks.—The California State Board of Health is encouraging the installation of laboratories at waterworks throughout the state, so that more frequent analysis may be made for the guidance of the men in charge of the purifying devices. Monthly analyses now made by the board are considered entirely insufficient, especially where the water is treated. Men in charge of the few laboratories that have been installed as a result of this movement have been visiting the laboratory of the Bureau of Sanitary Engineering maintained at Berkeley under the direction of C. G. Gillespie, chief engineer. There they receive instruction in the procedure and interpretation of analysis. Not only have chemists received instruction, but also a number of men without scientific training.—*Eng. News-Record, 80, 267 (1918).*

Public Health Clippings.

Prepared by R. R. Harkness.

Poetic Merchandising.—If I were Binks the baker, I'd tidy up my store; I would not have an acre of dust upon the floor. I'd be a skilled adjuster and make things please the eyes; I'd take a feather duster and clean the pumpkin pies. I'd keep the door knob shining, and polish up the glass, and never sit repining, and never say, "Alas!"

If I were Binks the baker, I'd have a cheerful heart, as always should the maker of bread and pie and tart; for looking sad and grewsome will never bring the trade of folks who want to chew some doughnuts and marmalade. When I go blowing money I always seek the store whose boss is gay and sunny, with gladness bubbling o'er; and when I chance to enter a bakery whose chief is roaring like a stentor about his woe and grief, his bellowings confound me, I do not spend a yen; I merely glance around me, and hustle out again.

If I were Binks the baker, and had a grouch on hand, I'd surely try to shake her, and smile to beat the band. For no one wants to hearken to tales of woe and strife, to hear of clouds that darken a merchant's weary life. For customers have troubles, like you, thru all their years; and when they spend their rubies they are not buying tears. They'll like you all the better, you and your cakes and jam, if you are not a fretter, a kicker and a clam.

If I were Bakes the binker—my wires are crossed I swow—I'd sell that pie and sinker with calm, unclouded brow. No grumblings wild and wooly would from my larynx slide; I'd swear that things were bully, and seven meters wide. Then folks would all admire me, and seek me in my den, and load me 'till they'd tire me, with kopecks, taels and yen.—Walt Mason. —*Cumberland Health Bulletin.*

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An Adequate Reason.—Officer (wearily)—Now, Smith, you've already had leave because your wife was ill, because your little girl had measles, and because you had to attend the christening of your youngest son. What—er, what is it this time?

Private Smith (briskly)—P-please, sir—I—I'm going to get married.—*London Opinion.—Jour. A. M. A.*

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HOW THE HEALTH OF THE BRITISH ARMY IS MAINTAINED.

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Read before the American Public Health Association, October 20, 1917, at Washington, D. C.

THE history of war has always been a history of epidemics. The very fact that in an army men are crowded together makes it easy for all communicable diseases, once introduced, to spread with great rapidity. And because soldiers are always associated with the civilian population, it means that such diseases are rapidly communicated from the army to the civilians; and from the civilians to the army. It is therefore apparent that during a war, disease, unless checked quickly, may run like wildfire through a country, and be disseminated far and wide by soldiers returning to their own homes, or other places while on leave.

It is necessary first to understand the nature of the medical organization of the British Army, and this will be better understood perhaps by following a wounded or sick soldier through the system from the front line to the base hospital.

The medical officer of a battalion has his regimental aid post somewhere close to the front line, in a cellar or dugout, but usually in the trench itself. Each day he holds a sick parade and men who are, or imagine they are, sick, come to him for advice and treatment. Working under the M. O. of the battalion are the regimental stretcher-bearers who bring in the wounded. Soldiers who are only slightly wounded, or are not too sick, after being given suitable treatment by the M. O., make their way back to the advanced dressing station.

This advanced dressing station is really an advanced section of the field ambulance, and is manned by officers from the field ambulance, who also have under them a squad of stretcher-bearers. The dressing station is usually located in some battered farmhouse, cellar or dugout, on or near a road and within a mile or so of the trenches. This enables the stretcher-bearers from the advanced dressing station to bring in those unable to walk from the trenches; it makes it possible also to evacuate at night by motor ambulance, the sick and wounded collected during the day. Very frequently also, narrow gauge railroads are used for the purpose of rapidly bringing in the wounded to the advanced dressing stations.

From the advanced dressing station the sick or wounded soldier, after any necessary preliminary attention, is taken to the field ambulance which is usually located in some large building three or four miles behind the line, where he is further attended to, ticketed with his diagnosis, given antitetanic serum if he has not already had it, and sent on by motor ambulance convoy to the casualty clearing station.

At the casualty clearing station, of which there are usually three or more together in a town, the men are again gone over, their wounds redressed, operations performed, and all the work of a hospital carried on. The towns in which the C. C. S.'s are located are situated usually out of practical gun range, on railroads and frequently on canals so that the wounded may be readily evacuated by train or barge to the base. These casualty clearing stations are arranged in groups so that when a battle is raging one hospital receives the wounded until completely filled up, while the other hospitals, which were filled perhaps the day before, are treating their wounded and evacuating them to the base.

The General or Base Hospitals are located scores of miles to the rear; on the seacoast where facilities are provided through hospital ships for the evacuation of the sick and wounded to England.

In addition to these medical units mentioned above, there are rest stations or convalescent homes behind the lines, where tired, "fed-up," and mildly shell-shocked men and officers are looked after and allowed to rest until fit to return to duty.

It is also necessary to realize that in the temperate climate of Europe the vast majority of communicable diseases of importance from the military standpoint are contracted largely from three sources:

Group 1. Directly from throat and nose secretions; this includes practically all of the ordinary diseases like measles, mumps, whooping-cough, influenza, colds, pneumonia, scarlet fever, diphtheria, etc.

Group 2. Directly from biting insects; *e. g.*, malaria, typhus fever, plague, etc.

Group 3. Indirectly through intestinal secretions containing the germs of typhoid fever, cholera, dysentery, etc., gaining access to the body through contaminated water, food and flies.

With this outline in mind it is easy to see that it is possible for such diseases to be held in check, provided that the sanitary and medical organization is such that the germs from one infected soldier can be prevented from reaching another.

It is obviously essential in the first place to remove from the army, at the earliest possible moment, every case of communicable disease after it has been diagnosed. This means that there must be some means for picking out soldiers who show symptoms of disease, which really comes down to the fact that medical officers must always be on the alert and carry out the instructions of the director of medical services of the army, with despatch; in the British Army this is one of the very important features in the control of epidemics. If a man is suspected of having any communicable disease he is instantly placed under quarantine until the diagnosis has been confirmed, after which he is removed from the army area altogether, as a possible focus of infection.

This method is practically the only means of eliminating diseases such as measles and scarlet fever which cannot be diagnosed by bacteriological methods, but of course the procedure is employed in all other kinds of communicable disease.

Great Britain has been fortunate above all other nations in this respect, that she sent over at first a small army of regular troops, perfectly equipped from the medical standpoint as well as in every other way. Efforts had been made for years to remove typhoid "carriers" from the regular army, and naturally no soldier was sent into the field who was known to have, or to be a "carrier" of, any contagious disease. Furthermore, the soldiers had practically all been vaccinated against smallpox and inoculated against typhoid fever.

As division after division was sent out to the army in France, they too were completely equipped with sanitary squads, casualty clearing stations, field ambulances, water carts, and other necessary medical equipment. Consequently as the army grew and expanded into a huge force it was thoroughly equipped, not only with the necessary apparatus for caring for the sick and wounded, but also with the experience acquired by those already in the field. In this way the British Army differed from all our European Allies which had been compelled to mobilize everything at once and found themselves woefully lacking in medical equipment and personnel.

It can be readily seen that the British Army began under auspicious circumstances, and that thereafter its freedom from contagious diseases depended to a great extent on the preventative measures adopted.

All excreta behind the front line and reserve trenches is destroyed in numerous incinerators which are kept burning night and day. The British Army is the only army which has succeeded in doing this. All other excreta which cannot be burned is buried so that it cannot be reached by flies.

It is the rule to sterilize all water used for drinking purposes, either by boiling, by bisulphate of soda, or by chlorine. The method of chlorinating water on a small scale in general use in the army, as it is in all of the other allied armies, was brought to the attention of the British Army authorities by the publication of a method evolved by the writer in 1909. This was particularly useful in the trenches where it was possible to accurately sterilize a pail or a barrel of water if necessary. Small tablets of hypochlorite of lime, each one sufficient to sterilize a pail of water, were also ordered and issued to the first Canadian division, and proved useful.

The great bulk of the water supply, however, is sterilized directly in the water carts by adding one or two spoonfuls of the dry chloride of lime to the partly filled water cart, the mixing being done by the addition of the rest of the water and by the agitation during the trip back to the place where the cart is stationed.

In addition to this, large mobile filter units after a plan draughted in 1914 and officially suggested by the writer in 1915, after experience in the field, were adopted throughout all the British armies. The mobile filters are capable of filtering and sterilizing large quantities of water and delivering it to water carts or into standpipes, ready to drink. A check is kept on the efficiency of the filtration by mobile field laboratories.

In each division there are some sixty water carts, each of which holds about 110 gallons. We attempted to get samples from all of these in turn, to see whether the water had been treated. As all the sources of water supply in Flanders, with few exceptions, contain large numbers of bacteria, and as a properly chlorinated water contains very few bacteria it was easy to tell from the bacteria and B. coli tests whether the water in the carts had been chlorinated; and these simple tests were adopted as a routine method of control. As we sometimes had eight divisions in our area at one time, this water control meant a good deal of work. The water carts were usually to be found at the headquarters of the unit to which they belonged, and we quickly discovered that the way to get the largest number of water samples in the shortest time was to travel by the map up and down the twisting narrow roads.

Reports of all samples were sent to the A. D. M. S. of the division, who forwarded them to the medical officers of the units, with more or less caustic remarks should samples be bad. The M. O. in turn would get after the man in charge of the water cart, who usually had some more or less plausible excuse. The water details of the first Canadian division were the best trained lot of men we ever ran across. The very first day we took samples from their water carts five weeks after the arrival of the Canadian division in France they were all sterile, and there were no complaints about taste. It was an excellent example of what training could accomplish, for they all had been carefully trained in their duties in Canada and England. As the water details of any division are constantly changing, the efficiency of the treatment depended to a great extent on the constant supervision of the problem by the A. D. M. S., medical and sanitary officers.

We have found divisions coming into our area for the first time with only 25 per cent of their water carts chlorinated, whereas before they left they would have 90 per cent or more chlorinated, and the division thoroughly educated as to the necessity of carrying out this process of sterilization properly.

Wells, springs, creeks and ponds were also examined, and not infrequently samples from "springs" encountered while digging new trenches were sent in to be tested. The tremendous number of bacteria found in some of these "spring" samples we have on several occasions reported as indicating the presence of some buried animal matter in the immedate vicinity of the springs, and have resulted in finding these surmises to be correct. In one case in which a badly polluted water was reported upon, the burial place of some fifty Germans was found to be only a few feet distant.

Standing orders forbid the use of unboiled milk in the army, as well as uncooked vegetables, so that there is little danger from these sources. When one sees the peasants watering their vegetables with fresh house sewage, the reasons for such regulations are apparent.

As it is possible for flies to carry typhoid bacilli and other disease germs from excreta to food, a constant war is waged against these filthy insects, and it is the duty of everybody concerned to see that all manure piles in the army area are gotten rid of. On the other hand, food is screened from flies whenever possible, and privy pits made inaccessible to them by the same means. On the whole, the house-fly has not yet, in so far as we know, played any great part in causing epidemic disease in the British Army, though both the house-fly and lice have been accused of carrying the organisms responsible for trench fever.

Mosquitos are responsible for transmitting malaria and yellow fever, though the latter never occurs in Europe. Malaria in France is also comparatively unknown, though we found the anopheles mosquito responsible for transmitting this disease, everywhere.

There were also numerous cases of malaria recurring in soldiers from India, Egypt, and other hot countries, so that we had both the infected individual with the malaria parasite in his blood, and the mosquito which was capable of carrying the organisms. Yet in 1915 we only had a dozen cases of malaria develop in men who had never been out of England, and were therefore, presumably, infected in France.

Typhus fever is one of the most dreaded diseases in the army. As yet there have been no cases of typhus fever in the British army in France, though it has occurred to a greater or less extent in Germany, Austria, Russia and Serbia. The quarantine services of the countries bordering on the Mediterranean have prevented it spreading to any other country through ships.

Typhus fever is known as a dirt disease, and its control is through the plentiful use of soap and water.

As every soldier in the field becomes more or less lousy, a persistent and continuous fight against this variety of vermin must be kept up, for lice are not only a potential source of danger in transmitting typhus fever and relapsing fever, but they are a great source of irritation to the men and responsible for much loss of sleep.

Hot baths are provided on every divisional area on the British front. Three or four miles behind the trenches in the rest areas, in places where a plentiful supply of water can be obtained, the army has established bath-houses. Sometimes a brewery, or part of it, has been taken over for this purpose, because the breweries all have deep wells from which a plentiful supply of water can be obtained. If the bath-house is in a brewery they may utilize the large beer barrels cut in two for baths. These are filled with cold water and live steam turned into the water to warm it for the men's baths. After the bath the men dump the barrels, which are immediately refilled by the attendants, for the next lot.

Most of the bath-houses, however, are in shacks built upon the edges of creeks or ponds. The water is pumped into an elevated reservoir and heated, frequently by means of a threshing machine boiler rented or purchased from some neighboring farmer. One section of the shack is divided off for a bath-room with a number of showers, and the other rooms devoted to the receiving of dirty clothing, storing of clean clothing, washing, drying, and sterilizing.

The waste wash water from the baths and laundry entering the creeks naturally causes trouble for troops downstream who have to use it for any purpose. Horses particularly will not touch soapy water, and the brewers object to making beer with it; they say it spoils the beer.

Consequently the sanitary officers have in many cases been compelled to put in tanks to treat this dirty water and purify it. This is usually done by adding an excess of chloride of lime, which precipitates the soap as a curd, carrying the dirt down with it. By sedimentation, and filtration through canvas, cinders and sand, the water is clarified and turned into the creeks again clean. Here the laboratory proved to be quite useful in helping the sanitary officer and engineer work out their methods of purification.

SUMMARY OF SANITARY METHODS IN USE.

By getting rid of cases of intestinal disease, "carriers" of intestinal disease, by destruction of excreta and garbage, screening of food, destruction of breeding places of flies, sterilization of drinking water, boiling of milk and vegetables, and in the case of typhoid and paratyphoid fevers, inoculation, the chances of intestinal disease germs getting through from one person to another are comparatively small, as the results indicate.

To show that the freedom from intestinal disease in the British Army is not due to accident, one example will serve to demonstrate. Early in the war, when the British took over from the French a section of the line in the Ypres salient, the Belgian population in the little village of Vlamertinge and neighborhood was being devastated with typhoid fever, and the French troops also had a good many cases. When the British troops took over the line they not only escaped getting typhoid fever themselves, but they succeeded in absolutely stamping it out from among the civilian population, and in getting rid of any "carriers" of the disease.

These cases were discovered by a house-to-house investigation by "The Friends' Search Party"—a group of Quakers who had conscientious scruples against bloodshed. This search party notified the medical authorities, particularly the laboratory in the area, of any doubtful cases, and the diagnosis was then made where possible by laboratory methods. In the last six months of my stay in France, near the Belgian border, I do not think that the Friends' Search Party unearthed a single case of typhoid fever, and as a matter of fact few cases of the ordinary epidemic cases such as measles or diphtheria were discovered, although the party continued to make house-to-house investigations and report to us regularly.

All of the bacteriological and hygiene work for the various ambulances, casualty clearing stations, rest stations, medical officers, sanitary officers and even veterinary officers in the area is done by the laboratory.

From this sketch of the organization of the medical service, its arrangement, the diseases which must be controlled and the sanitary methods in use, it may be seen how and why a laboratory can well fit into the system.

The mobile laboratories are usually established near a group of casualty clearing stations, for which they do the necessary clinical laboratory work as well as bacteriological work. In connection with each group of casualty clearing stations there is usually one section of one casualty clearing station used as an isolation hospital, to which are diverted all the cases or suspected cases of contagious disease. Naturally the laboratory is called upon to confirm the diagnoses made in such cases.

Most of the routine bacteriological work of the laboratory is of much the same nature as that of a health laboratory at home, and consists of examinations to detect cases or carriers of the ordinary communicable diseases such as diphtheria, cerebro-spinal meningitis, typhoid fever, malaria, dysentery, tuberculosis and venereal diseases.

Should a case of diphtheria for example be found in a soldier, all of his immediate friends and companions with whom he had been in contact would be swabbed to see whether they were infected. Those found to be infected would be removed from the army at once.

In a case of suspected typhoid fever, the examinations of serum, blood and excreta would be made. If found to be a case of typhoid fever the laboratory would be called upon to try to discover the source of the infection. The same general methods hold in other epidemic diseases where a laboratory is capable of making the diagnosis, to discover whether danger lurks in "contacts" or "carriers" and to find the source of the infection where possible.

Very frequently material from wounds is sent in by the hospital surgeons, to see whether wounds are infected. The soil of Flanders has been liberally manured for hundreds of years, and in every cubic yard of this manured soil there are apparently millions of the germs which cause gas gangrene and tetanus when introduced beneath the skin. If a wound is infected with the germ causing gas gangrene or with other dangerous organisms, the knowledge that they are present may materially modify the treatment used by the surgeon, and the laboratory is sometimes of value to him in determining that point.

The varied nature of laboratory work in the army and its practical applications may perhaps be better appreciated from some typical examples.

One day the officer commanding a hospital sent to us a pint of tea suspected of poisoning 28 out of 29 men who drank it. From the history of the affair we did not believe that the tea could possibly be the cause, and after making a few rapid tests to exclude metals we proved that the tea was not poisonous by the simple practical test of drinking it,—Major Rankin being the official tester. The report of our physiological test rather astonished the British authorities.

A German gas mask found on the battlefield was submitted to us to find what chemicals were present. That mistakes were sometimes made by the Germans was quite evident when we found that the mask had not been treated with chemicals at all; some of the Huns at least had been unprepared for a gas attack.

The clarifying apparatus connections of the water carts frequently broke in certain definite places. Recommendations were made by our laboratory, after experimentation with rubber instead of rigid connections, which resulted in all of the carts in the British Army being equipped with rubber connections, and consequently in improved efficiency.

A great deal of experimental work was done with chlorine gas and the efficiency of gas helmets. Experimental physiological and pathological work was done on animals with chlorine and other gases; work on the drying out and deterioration of gas helmets, and the chemicals used in them, was also carried out.

Quite a number of cases of nephritis occurred among soldiers, and arsenic was suggested as a possible cause. We were therefore asked to examine a considerable number of samples of wine and beer to see whether traces of arsenic were present or not. None was found. A large quantity of wine found to be diluted with ditch water, and sold to our soldiers, was destroyed and the vendors fined.

One day a young medical officer, so excited that he could hardly speak, rushed into the laboratory with a lot of dead fish. After some questioning we found that there were tens of thousands of dead fish in the Aire-La Bassee Canal, and as this ran through the German lines he suspected that the canal water had been poisoned. We told him that we thought the fish had probably died from asphyxiation as a result of organic matter being dumped into the stream. He went away unconvinced but returned later in the day to report that he had discovered that the fish in the canal died every year when a certain distillery dumped certain waste material into the canal. Thus did our old experiences with starch mills dumping their waste into Ontario streams, and killing fish, prove of unexpected use.

The laboratory was used a great deal by the highly trained officers of the Indian Medical Service, who were always wanting some unusual insect or parasite identified, and made a good deal of use of our little working library.

A soldier died suddenly one day without any preliminary symptoms. It was thought that it might be due to poison, and if a case of suicide his wife would have been deprived of her pension. We were asked to examine the stomach contents to decide whether poison was present or not, but no poison was found.

A little vial found beside a dead German and containing a small amount of material was sent in for us to determine the nature of the contents. It proved to be opium, and the owner had evidently been prepared for a painless passage across the Styx whenever such necessity should arise.

Occasionally we had to investigate possible causes of cholera among troops coming from India. One day we received a long telegram to proceed to a certain village about ten miles away and report on the sanitary surroundings and particularly on the water supply of a place where an old Frenchman had died of "choleric dysentery." We found the house after some search and discovered that the old man had died a month before, and that the suspected water supply, unboiled, had been used since that time, by a certain headquarter's staff,—without ill effects. Needless to say this was the best proof obtainable that the water supply was safe.

Another unusual problem arose out of the fact that several soldiers had contracted anthrax, both in England and in France, and the shaving brushes issued were suspected of being the cause. We undertook to search for anthrax spores, but found it was too long and tedious a job for a field laboratory, for the brushes were full of spores of all kinds. Later on in England anthrax was actually found in some of these brushes, according to reports since published.

These few examples taken at random will serve to demonstrate the varied character of the work of a field laboratory, and to show that a certain amount of experience is necessary in order to effectively handle some of the problems constantly arising. We were peculiarly fortunate in our combined experience. Major Rankin, a first-rate pathologist and bacteriologist, had been in charge of the government laboratory at Siam for five years previous to the war, and knew tropical medicine like a book, while Captain Ellis had worked for three years in the Rockefeller hospital laboratories in New York, and was thoroughly conversant with recent work in serum diagnosis and therapy. Consequently between the three of us there was little we could not tackle, either in bacteriology, pathology, sanitation or treatment of epidemic disease.

Whenever an action was about to occur on the front the hospitals were evacuated of all sick and wounded in order to obtain the maximum number of beds. Consequently when fighting was going on the hospitals were very busy with surgical cases but the laboratory routine greatly decreased because there were few sick. We therefore undertook investigations of various kinds, to keep busy and be of the greatest amount of use.

At the suggestion of the D. M. S. of the army, Major Rankin made a survey of the army area for Anopheles mosquitos. The Indian corps was in our area at the time, and he obtained the coöperation of the officers of the Indian medical service, who, being particularly keen on biting insects, collected many specimens for him. In spite of the Anopheles mosquito being found everywhere, Major Rankin reported that he did not believe there would be much malaria, and such proved to be the case. Major Rankin also made an extended investigation with one of the physicians of a C. C. S. into the cause of trench fever and although the results were largely of a negative character it cleared the ground for other workers along the same line.

Captain Ellis began an investigation into the grouping of the various strains of "meningococci"—with the ultimate object of obtaining a more potent anti-serum in the treatment of cerebro-spinal meningitis. He also carried on work relative to the cause of trench nephritis.

Apparatus designed to purify wash water from baths before turning it into the streams, the building of small chlorinating plants near the trenches, and the construction of field incinerators for consuming garbage, were referred to us for consideration and suggestions, so that we had a variety of sanitary work of an interesting and useful kind, which helped to keep us busy.

The nature of our activities carried us through the area of shell fire, among the batteries, and sometimes quite close to the trenches. We were more or less free lances, and in travelling about in the course of our work we saw everything in one sense, more or less from the spectator's standpoint.

Many sad and depressing sights were witnessed, and one got an impression of what war means to an invaded country, such as can only be attained by actual experience. Quite frequently refugees were crowded together with their countrymen who had given them shelter, with disastrous results.

Accompanied by the sanitary officer of the 19th division, one morning, I saw a very sad example of what ignorance of the laws of hygiene can bring about. Down on a swampy spot, on a branch of the canal, was a little hamlet, and one of the tiny houses was occupied by a family of refugees from La Bassee. When we entered the house, swarms of flies flew up from the table and buzzed about while we did our best to prevent them from settling upon us.

The father of the family was in bed, unconscious, with typhoid fever. The mother, dead from the disease, had been buried the day before.

During the funeral the eldest daughter, a pretty girl of sixteen, sat up in a chair trying to look after the visitors. When we called she was also in bed delirious with the disease in the same room as her father. The baby in the carriage had had typhoid fever. A little two-year-old boy was just recovering, and was thought to have been the original case. The other boys of seven and nine years of age were getting some bread and milk for their dinner, one of them being probably a mild case; and a girl of eleven, evidently coming down with the disease was going about looking after the household. With that swarm of flies in the house there was no possibility of any of them escaping infection. It was with the greatest difficulty that the sanitary officer of the division succeeded in getting the cases removed to the French civilian hospital. The father died a week later, and the sanitary officer himself was subsequently killed during the battle of the Somme.

The best indication of the efficiency of the medical service of any army after all is its record of cases and deaths from preventable causes. The record of the British Army in France from this standpoint is a remarkable one, and a magnificent example of what applied bacteriology, sanitation and hygiene have been able to accomplish.

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The Dispensary in Public Health Work.—Mr. Michael M. Davis, writing in *The Modern Hospital* on the dispensary as a factor in public health work, calls attention to the development of the dispensary from the time in the seventeenth century when it was a "medical soup-kitchen," merely dispensing medicine to the poor, down through the period when medical advice began to be furnished, until at the end of the nineteenth century it really became a factor in public health work.

The new public health function of the dispensary had its inception in the antituberculosis movement and finds an increasing development in "well-baby clinics," pre-natal and obstetrical clinics as well as in dental and other clinics of the school period. Another and a most important type of clinic bound to come to the fore in wartime is the dispensary for venereal diseases.

The general dispensary or out-patient department, according to Davis, has large opportunities for preventive work because it reaches disease in its early stages; because it can treat minor diseases rarely taken to a private physician and yet requiring treatment if more serious affections are to be avoided; and because it can supervise the convalescence of hospital patients. And withal, it has the opportunity to teach as well as to heal.

The essential need of a social service department in the dispensary is strongly emphasized. (*M. E. C.*)

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Venereal Diseases in the Army.—1. During the twelve weeks ending December 7, 1917, there were reported from 31 cantonments 21,742 new cases of venereal disease. The incapacitation of these men involves not only loss of time; in addition, it has cost the government to keep them during the period of hospital confinement (which varies from one to eight weeks) more money than is required to maintain the entire command at Camp Dix (the cantonment in New Jersey with 20,859 men), plus an additional sum for medical treatment.

2. This is not all. Inevitably the disease will relapse in hundreds of these cases, in many instances after the men have been transported to France and presumably put into condition for service at the front, at a cost to the nation of probably $1,500 for each man.

3. The important fact in this connection is that a large proportion of venereal disease cases originate, not in the camp or in communities surrounding the camp, but in cities and towns from which the men come and through which they pass on the way to camp. Reports from the Surgeon-General's office show this. The enormous cost to the government on account of venereal disease is due largely, therefore, to conditions in civil life.

4. A study of the above facts shows an urgent need for an organized attack simultaneously by all states on the problem of venereal disease. When only a few states deal with the problem spasmodically, the result is to drive the principal carriers (prostitutes) from one state to another. State Boards of Health in each state, therefore, should now enlist the coöperation of state councils of defense, governors, mayors, chiefs of police, police judges, district attorneys, city attorneys, superintendents of hospitals and educators in an organized attack on these diseases.—*Florida Health Notes.*

SOME CONSIDERATIONS AFFECTING THE REPLACEMENT OF MEN BY WOMEN WORKERS.

Josephine Goldmark,
Publication Secretary, National Consumers' League, New York City.

Read before the Industrial Hygiene Section, American Public Health Association, October 19, 1917, at Washington, D. C.

AMONG the many new and urgent problems of industry in wartime, none challenges our best thought more sharply than the replacement of men by women workers. This movement which has gone far abroad, is still in its infancy in this country; yet it is not too soon, it is, indeed, high time to gauge the tendencies and consequences of so radical a change. The replacement of men by women, proceeding in many industries and occupations in every state of the union, must of necessity react for good or for ill not only upon the girls and women so employed, but upon far wider circles, upon their families, their children, and upon the whole standard of living of their communities.

In this country it is too soon as yet to hazard an estimate of the numbers of women who are entering upon new occupations and taking men's places. The number of the women so employed is not yet numerically great; their employment is in many cases still experimental, but we are undoubtedly on the threshold of great innovations. Girls and women as messengers and elevator operators, as section hands and towermen on railroads, running drills and presses, working in powder-mills and sawmills, cleaning the outsides of railroad coaches and wiping engines, in the machine shop, in the munitions plant, in the airplane factory—these are some of the new figures in industry.

Benefits of the Change.

Among the benefits from the new widening of women's employment one of the most important is the breakdown of prejudices. Women have in the past been hampered in advancing industrially by the prejudices of both employers and their fellow workmen, organized and unorganized. Women's sex and inexperience has been made the excuse not only for all manner of exploitation but for the refusal of employers to advance them to positions of responsibility and trust. One of the triumphs of women's wartime employment in England has been their response to opportunity: the intelligence and the speed with which they have reacted to instruction in intricate new work such as the manufacture of aero-engines and guns as well as in the simpler operations of making shells, fuses, hand grenades, etc. This is the universal testimony: to the unbounded surprise of all, women have proved their ability to enter upon and succeed in work hitherto closed to them on the sole ground of their sex.

And this success has been a triumph not only for women workers, but for the new methods of instruction in industry. Instead of the old rule of thumb and the mere copying of fellow workmen by apprentices and new workers, there has been intelligent direction of the working women newly introduced into the workshops of England. Mr. Granville Baillie of the British Ministry of Munitions, at a conference on Women in Industry in London last May, told how the new training had enabled working women to surprise the world by their achievements in industry, by the speed, the accuracy and the responsibility with which they have mastered their new trades. The training has been most successful when carried on in the plant where the women are to work. Under the British Ministry of Munitions, training schools were established with a view to giving untrained women some general technical instruction for the simpler processes in the engineering and chemical trades. This has been best carried out in the individual shop rather than in technical schools.

Throughout the world women are entering these new fields. Between July, 1914, and January, 1917, the number of women gainfully employed in Great Britain had increased by almost one-third. According to the London *Labour Gazette* of August, 1917, 1,256,000 women are directly replacing men.* In Germany the number of women employed in metal trades alone in July, 1916, is reported to have been over 3,000,000. In France the Minister of Munitions stated just a year ago that 300,000 women had gone into munition works; from Italy it is officially reported that the number of women employed in munition works in Lombardy has risen from over 4 to about 10 per cent of the total number of employes.†

Undoubtedly in this country many promising fields are opening for women from which they have been debarred and for which they are well fitted. Such are the new positions in many branches of the railroad service; for instance, as freight checkers, as ticket agents, and as information clerks, weeding and clearing the tracks; in banks and financial houses; in cost and production departments; as floor walkers in stores; as clerks in shoe stores, etc. In machine shops women are found to excel men at inspecting and testing and other operations requiring dexterity. In many instances, too, women are now receiving far higher wages than ever before for work no harder than women's traditional exhausting labor of scrubbing floors during long hours in dampness and wet. Yet, granting all that promises from such gains, no one can view without alarm the indiscriminate employment of women which is in process or impending in such heavy work as glass making, in some of the processes of steel mills exposed to extreme heat, as ballast tampers or freight handlers on railroads, as pilers of lumber and loaders of scrap iron, or in the bleachery pits of cotton mills,—to mention some of the occupations most needing scrutiny and care.

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* Monthly Review of the United States Bureau of Labor Statistics, October, 1917, p. 41.

† Child Labor in Warring Countries. A Brief Review of Foreign Reports. Industrial Series No. 4. The Children's Bureau. United States Department of Labor, pp. 12, 13, 14.

EVILS NEEDING SCRUTINY.

If the achievements of women workers challenge the world's admiration, we cannot neglect the obverse side of the picture. We have not yet learned the cost, the wastage of woman power.* There is no doubt that both abroad and in this country unmistakable dangers are inherent in many of the new occupations. Some indeed are totally unfit for women; some may be rendered fit by changes in method of management; in all of them the indispensable prerequisite is a new scrutiny of the workers and the effect of the work, a kind of intelligent supervision known hitherto in only a very small number of the most enlightened establishments but needed now wherever women are employed in new lines of activity if we are to preserve our national energies.

LIFTING EXCESSIVE WEIGHTS.

Of the specific dangers to be guarded against, one of the most obvious is the lifting of excessive weights. This has long been recognized as a source of injury for women. In no occupation hitherto engaged in have the chances of physical harm from lifting excessive weights been greater than, for instance, in the proposed employment of women in railroad freight yards. One road which has contemplated such a step, stated that the weight of goods to be lifted would run up to 100 pounds. No argument is needed to show that such work, continued through the day, is unfit for women and should be totally prohibited. It is true that in laundries, another traditional employment of women, women are expected to lift bundles often weighing more than 100 pounds. This is undoubtedly a source of physical injury; in freight yards such burdens are not an occasional part of the work but constitute its main part. In one railroad yard girls themselves weighing not more than 115 pounds, were found wheeling metal castings in wheelbarrows up and down inclined planks and loading them into the cars.

A recent report from Germany shows that among women employed in the metal trades heavy lifting is a main cause of physical injury. The inquiry covered over 2,500 establishments employing more than 266,000 women and girls, an increase of 319 per cent over the number employed before the war. Projectiles weighing from 22 pounds to 82 pounds have to be raised breast high from the floor and clamped down, then unclamped and placed again on the floor. According to this report, given in *Soziale Praxis* of April 19, 1916, there is great complaint of abdominal trouble among the women who raise these weights. In one establishment which required very hard muscular work, it is reported that nearly a third of the 42 women employed "have been disabled by illness."†

Clearly, in any occupation which requires heavy lifting, as for instance in corerooms, a maximum weight should be set. In New York State a maximum of 25 pounds has been fixed by law regulating women's work in foundries. A maximum of 25 pounds in lifting weights was adopted also in the valuable standards formulated by the Executives' Club of Detroit last spring representing 40 of the largest industrial plants in that city.*

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* See Women's Industrial News, London, July, 1917.

† Monthly Review of the United States Bureau of Labor Statistics, September, 1917, p. B4.

The establishment of a maximum weight in lifting is obviously a rough measure of protection. In all occupations safety lies only in the physical examination of all prospective workers, or better in the medical supervision of workers, as Doctor Schereschewsky has well phrased it in a recent address.† For some women doubtless even 25 pounds is excessive, when lifting constitutes a large part of the day's work. The relation of the lifted weight to the chest and abdomen circumference, the total physical condition of the worker, should be determining and can be settled only by a medical examination before employment.

INDUSTRIAL POISONING.

Another obvious danger calling for close observation in some of the new occupations is that of industrial poisoning. Thanks to Bulletin No. 219 of the Federal Bureau of Labor Statistics by Dr. Alice Hamilton, we have knowledge of the extent and nature of industrial poisoning in the manufacture of high explosives, so far as it could be ascertained by investigation of the first order. In this country women have not yet been employed in large numbers in the manufacture of TNT, in filling shells, or in those nitration processes whose victims show the same symptoms, suffer and die exactly as do the victims of gases in trench warfare. Yet it is known to the writer that in precisely one of the worst conducted TNT factories, where the sanitary precautions are nil and the TNT is allowed to cover the ground, the workroom and the workers themselves, women are among the operatives. As the manufacture of explosives grows by leaps and bounds in this country, and new gases are developed and manufactured, as other poisons are increasingly used such as the various dopes for airplane wings, women will increasingly be employed in these dangerous processes. As a sex they are known to experience more serious injury than men from such an industrial poison as lead. This may be true of other industrial poisons not yet studied. Safety here lies only in the enforcement of sanitary precautions, in periodic medical supervision, in the shortening of hours of labor and in the prohibition of night work for women.

OVERFATIGUE AND NIGHTWORK.

In all of the new occupations as in the old, too much emphasis cannot be laid upon the factor of fatigue in predisposing to illness and exhaustion. It did not need the well recorded wartime experience of England to teach us that output together with health and vigor fails when hours of work are excessive, when Sunday work is permitted and rest at night broken. Yet within the last year even the enlightened State of Massachusetts, the pioneer in labor legislation and for twenty years the leader in prohibiting night work for women employed in factories, has under the plea of war emergencies reëstablished night work and overtime by special permit to specified establishments.

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* Industrial Management, August, 1917.

† Public Health Reports. Reprint No. 234, November 20, 1914.

It is well known that the greatest efforts have been needed to prevent the breakdown of labor laws in many states and the reëstablishment of excessive hours of labor for women.

The labor standards for European countries, especially for women and children, were in many respects lower than our own before the war. In the first rush of industry, following the outbreak of the war, these standards abroad were still further lowered. Yet it soon proved that the relaxing of standards failed to achieve its purpose; in England and France and more recently in Italy definite steps were taken by the governments to restore the provisions of the labor law in order to maintain output and conserve the workers. In Italy indeed, the present standards are in some respects higher than before the war.*

Besides the recent reëstablishment of night work in factories, another new form of work at night for women in this country is in the elevator service. Here is an occupation newly open to women throughout the land. They are operating elevators in department stores, hotels and apartment houses, in large and small cities, from California and Utah to Texas and Maine. The work itself does not appear ill-adapted or injurious. The hours of duty, however, are often excessive and cannot fail to be harmful. In New York City for instance, girls are working in apartment houses 15 hours at a stretch; day and night work alternates each week and when the shifts change, the girls are on duty without relief from 6 p. m. to 12 o'clock noon, a continuous stretch of 18 hours. The girls are required to attend to the switchboard telephone as well as to run the elevator. Sunday work is required. One of the most serious abuses of this employment is the exposure of young girls to insult or danger on the all-night shift. In some instances no provision whatever is made for getting rest at night. In other cases an army cot is provided in a hall alcove. In another instance the young elevator attendant sought safety by running the elevator between the first and second landing to obtain sleep between summons.

Nightwork for women has been newly introduced also in the work of automobile cleaning. Women are being employed in New York City garages more than twelve hours each night—from 7 p. m. to 7.30 a. m. They clean from thirty to thirty-five cars during the night.

Another new occupation which exposes girls to moral dangers is the messenger service. In many cities girls are being increasingly employed to replace boys at this work, which should be closely watched. For the dangers involved in sending young boys to questionable houses or resorts has been so great that within the past few years legislation has been enacted in most of the states, raising the age limit of boys in the messenger service and prohibiting their employment after stated hours of the evening. It would indeed be a mockery if young girls were now employed at work which has been found unsafe for boys up to 21 years. To safeguard these young workers, legislation is needed so as to include the new occupations in the existing laws limiting hours of labor, etc. Other states might well follow the enlightened action of the State of Washington where the employment of female minors in the messenger service has recently been prohibited by ruling of the Industrial Welfare Commission. In some states, too, efforts are on foot to regulate by law the new employment of girls as bootblacks.

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* Child Labor in Warring Countries. Industrial Series No. 4. The Children's Bureau, United States Department of Labor, p. 61.

THE NEED OF EQUAL WAGES.

In regard to the general replacement of men by women workers, no single consideration is more important than the matter of wages. This is, moreover, not a social or economic question alone. It is primarily a question of health and must be of the first importance to all those concerned with public health issues. It was General Gorgas himself who put in a few trenchant words the close connection between wages and health. He ascribes to the results of increased wages of the common laborers the world-famous improvement in health at Panama. "I am satisfied," he said to a conference of health officers, "that to this improvement in social conditions, caused by our high wages, we principally owe our extraordinary improvement in general health conditions."*

Another medical opinion on the relation between wages and health has recently been well put in a study of Occupation and Mortality:† "We believe," say Doctors Wynne and Guilfoy, "that wages have a most important bearing upon the morbidity and mortality of any occupation, because, where real wages are high, the standard of living is correspondingly high, housing is better, food is more plentiful and more nourishing; and, in short, conditions are more favorable to physical and mental well-being, which results in greater resistance to disease, more recuperative power, and a healthier enjoyment of life, all of which stimulates the worker to preserve his health and makes him more alert to guard against accidents; whereas when wages are low, home conditions are of necessity unfavorable, and if in addition shop conditions are also bad, as they frequently are, the hazards of any occupation are increased manifold."

The great danger from the standpoint of health is that the employment of women should be resorted to merely in order to obtain cheap labor. As a matter of public health we must see to it that women are paid equal wages for equal work. Otherwise their employment can be and is daily being made the excuse for undercutting the standard wage of men and so reducing the whole standards of living in the community. The reports of the Children's Bureau and the Public

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* New York State Department of Health Monthly Bulletin, December, 1915, pp. 369–70.

† Occupation and Mortality. Their Relation as Indicated by the Mortality Returns in the City of New York for 1914. Reprint No. 400, Public Health Reports, June 8, 1917.

Health Service have shown how infant mortality rises *pari passu* with a fall in wage.

It is true that in many of the new occupations women are unskilled and need training. Yet even while they are being trained they should as a matter of health be paid an adequate wage. The standards adopted by the Executives' Club of Detroit to which reference has been made, recommend that while learning, women shall be paid the flat day rate paid to men for the same work or operation.

There are many other pressing health problems in women's new employment needing wise consideration, which cannot even be enumerated here. Instances are beginning to multiply of the lack of decencies and sanitary provisions for women employed in railroad yards and round houses; the housing of women who must leave home is a pressing problem; the matter of clothing is highly important; women obviously cannot do men's work in ill adapted clothes such as skirts which are usually too full or too tight for safety and which are dust gathering in the dangerous trades, or in high-heeled shoes, more quickly inducing fatigue. Separate entrances should be provided for men and women especially in occupations involving heat and grime; the nutrition of the workers, and the provision of restaurants or lunch counters, is a chapter of immense importance.

SUMMARY: THREE ESSENTIAL SAFEGUARDS.

In summing up this brief survey of a large topic, emphasis should be laid upon three essential safeguards for girls and women entering upon men's occupations: equal wages, additional legislation and adequate medical supervision. I am aware that in making a plea for this last requisite, I am treading upon very difficult ground. The pressure for physicians for military and civilian needs is so great that a plea for new industrial supervision may appear ill-timed. Yet if any one truth has emerged from three years of warfare it is the indispensable nature of our industrial contribution. To preserve that is a part of the nation's self preservation.

The methods to be used in obtaining adequate medical supervision are of primary importance, and in this connection the National Consumers' League has engaged in a campaign for the establishment of industrial clinics.

Local conditions must determine whether these clinics should be under private, state or federal auspices. But the early diagnosis and treatment of workers suffering from industrial diseases by physicians who know industrial processes and conditions is the only means of more fully learning and controlling these diseases, hitherto little studied. The growing employment of women should be an added incentive to establishing industrial clinics, especially wherever large numbers of workers are engaged in dangerous processes. Where private means or enterprise are lacking and where work on government contracts is being done, it would seem peculiarly fitting for the Public Health Service to establish such clinics and so lead the way in measures of enlightened prevention as well as cure.

CHICAGO'S TUBERCULOSIS PROBLEM.

John Dill Robertson, M. D.,
Commissioner of Health, Chicago, Ill.

Read before the Public Health Administration Section, American Public Health Association, October 18, 1917, at Washington, D. C.

IN 1908 the Chicago Department of Health made tuberculosis a reportable disease. In that year the number of deaths from tuberculosis was 3,915, while only 2,577 cases had been reported to the Department of Health. The number of cases reported increased from year to year in relation to the number of deaths, but it was felt, even with this showing, that the full number of cases was not being reported.

In addition to the maintenance of dispensaries as a method of reaching the tuberculosis patient, and with the idea of getting in touch with children in incipient and easily curable stages, in the spring of 1916 the Municipal Tuberculosis Sanitarium assigned to work in the public schools a force of one hundred doctors and nurses, who worked in conjunction with similar forces from the Department of Health in making physical examinations of pupils. During the school year, September, 1916, to July, 1917, 114,405 examinations were made, and 50,343 pupils were found to have physical defects. Of this number, 4,594 were referred to the Sanitarium dispensaries for further examination, for which examination 2,498 children appeared at dispensary. A diagnosis of tuberculosis was made in 1,407 of these cases, and this number was recommended for open air school treatment.

Having before me, then, such data as were obtainable from the Health Department records of tuberculosis cases reported by the private physician, the deaths recorded, the work carried by the dispensaries, and the results of the examination of school children, I was convinced that a plan different from those already followed must be adopted if we were to have any reliable statistics as to the prevalence of the disease or to make any appreciable dent in its ravages.

Consequently, on August 2, 1916, I introduced a resolution before the board of directors of the Municipal Tuberculosis Sanitarium for the purpose, first, of locating and referring to the dispensary those infected with tuberculosis in the area surveyed; second, to establish their social and financial status; third, to determine the sanitary conditions under which they live; fourth, to collect information in regard to the housing conditions in the area.

The eight square miles of Chicago's most congested districts were selected for this survey. This territory comprised, in the north section, that densely populated Italian district known as "Little Hell," as well as a number of lodging houses, stores, cheap hotels and manufacturing establishments; it embraced the heart of Chicago—the "Loop"—and the south section took in the best business quarter of the city, which also is occupied by Chinese restaurants and stores, railroad freight depots, warehouses, and many large factories.

Dr. Clarence L. Wheaton and Dr. John Ritter of the Sanitarium staff, well known diagnosticians and clinicians in the field of tuberculosis, superintended the work, Doctor Wheaton in the north section and Doctor Ritter in the south. Under these men, eight physicians experienced in tuberculosis dispensary work were appointed. The actual field work was performed by fifty-five physicians under the personal direction of their supervisors.

All registered cases of tuberculosis in the district were given to the physicians for follow-up, and examination. These cases were known and designated as "old" cases, and comprised 4 per cent of the total tuberculosis cases found in the survey.

Having thus acquainted himself with a number of people in his district, the physician was instructed to begin his house-to-house canvass. He asked permission to examine each member of the family found at home at the time of the call, and, if there were any not at home he returned in the evening to examine them. Educational literature, printed in six languages, was distributed in all homes and places where examinations were made.

The method of procedure in making examinations was as follows: all male patients were stripped for chest examination. In the case of females, the clothing was partially removed and the stethoscope was always placed next the skin. If the findings then warranted further examination of the chest, the clothing was removed and some light article of clothing substituted that permitted of easy exposure of limited areas during the process of the examination. It was not thought necessary or advisable to strip women to the waist.

In making diagnosis, efforts were made to secure sputum specimens, but open tuberculosis was recorded when the findings on physical examination indicated moderately advanced disease, and, in the third stage cases, cavity formation, regardless of whether specimen was obtained or not. In the incipient stage of the disease, the diagnosis of open tuberculosis was not recorded except upon demonstration of the germ. Where sputum could be obtained by the survey physician, patients were requested to take specimen to the nearest dispensary, whence it was sent to the laboratory for examination.

The symptom complex for glandular tuberculosis included, first and foremost, history of tuberculosis in parents or exposure to the disease; enlargement of supraclavicular glands, tracheo-bronchial adenopathy; enlarged tracheal glands; Eustace Smith's sign of bronchial adenopathy; tubular breathing at sides of sternum; harsh breathing posteriorly; bronchial breathing at interscapular space at one side. In a few disputed cases, X-ray and the tuberculin test were employed. Many cases of enlarged cervical glands were eliminated as non-tuberculous where there were findings of pediculi, enlarged tonsils, decayed teeth or other disqualifying symptoms.

Data with reference to duration of disease, possible source of infection, length of residence, nationality and housing conditions were secured; in fact, every effort was made to secure a comprehensive report on each case examined.

The field physician made a written daily report to the supervisor of all work accomplished. In order that there might be uniformity of methods of handling the work, daily and later weekly conferences were called of all field physicians and supervisors.

Each case report was required to bear the signature of the field physician who made the examination and to be countersigned by the field supervisor, before receiving the approval of the general supervisor. Every possible effort was made to secure accurate work and records.

Little difficulty was experienced in obtaining permission to make examinations.

Our physicians were interested and faithful, and did the best work possible. Perhaps 100 per cent efficiency was not attained in this survey—it may be open to some criticism—but it is no less infallible than the work of the medical profession generally.

After careful analysis, I have concluded that approximately 75 per cent of the cases of tuberculosis among those examined have been tabulated. The large number of new and unreported cases found fully justify the expenditure—$42,076.

The population of the eight square miles of the survey district was estimated from the 1916 school census at 371,259. The total number of persons examined was 165,700. Of this number, 14,282, or 8.6 plus per cent, were found to be tuberculous. The medical classification of these cases is as follows:

		Per cent
Pulmonary	5,876	41.1
Glandular	7,269	50.8
Pulmonary and glandular	815	5.7
All other forms	322	2.2

You will note the large number of glandular cases recorded, many of them among children.

An analysis of 6,610 cases classified as first, second or third stage cases shows that 4,407, or 61 plus per cent, were incipient; 2,240, or 33 plus per cent, moderately advanced, and 323, or 4.8 per cent, were far advanced.

The method of differentiation between "open" and "closed" cases has already been described. Due to the fact that it was possible to secure sputa in only a small percentage of the cases, and the further fact that a case may be an open one this week and a closed case next week, I do not feel that the 1,030 cases tabulated as open cases represent the true percentage of the total of 11,361 cases considered.

Neither the colored belt nor the Chinese district were included in the survey, therefore only 156 colored and 30 of other races are among the 14,282 cases found, making 14,096 contributed by the white race.

The following table shows the birthplace of the 14,282 cases:

Chicago	7,216
U. S., elsewhere	1,965
Italy	1,590
Poland	816
Russia	693
Austria	368
Germany	345
Scandinavia	238
Ireland	210

Great Britain	185
Hungary	174
Bohemia	102
Lithuania	12
Other Slavic	52
Other Germanic	29
Other Latin	183
Other foreign	95

The length of residence in Chicago of 14,025 is as follows:

Since birth	7,180
Less than 1 year	397
1 to 5 years	1,718
5 to 10 years	1,792
10 to 20 years	1,890
Over 20 years	1,048

There were 734 more females than males. This is accounted for by the fact that in a house-to-house survey, such as this was, more women than men were examined.

Records of the ages of those found tuberculous were compiled from statements of the parents or some member of the family; it is obvious that data could not be verified from birth records. Of the number found to be tuberculous 932 were under 3 years of age; 6,432 between 3 and 14; 1,165 were between 14 and 21 years of age, while the adult years of life, or what might properly be called the productive period, from 21 to 40 years, showed 3,747 cases. The period from 40 to 60 showed 1,675, and over 60, 300 cases.

The large number of children examined accounts for the fact that 9,787 persons were classified as unmarried; 3,888 were married, 526 widowed and 81 were divorced.

Statistics as to religious belief show 71.7 per cent Catholic; 18.1 per cent Protestant; 8.2 per cent Hebrew, the balance being without history.

Catholic	10,250
Protestant	2,588
Hebrew	1,181
Without history	263

Great difficulty was experienced in securing data as to occupation, the Italian being particularly loath to give the nature of his employment. Information obtained in 6,069 cases showed 443 persons engaged in some manner in the handling, packing or preparation of food products, 282 were cooks or waitresses, 305 were engaged in the manufacture of clothing, 34 were barbers, 26 cigarmakers; other indoor occupations contributed 4,108, and outdoor occupations 871. Occupation is unaccounted for in 8,213 instances, which number includes 7,395 children under 14 years of age, nearly all of whom are without occupation. This brings the actual number unaccounted for down to 818. The housewife was tabulated as employed, her working conditions being the sanitary condition of the home. Her hours of employment and wages were, of course, not obtainable.

The hours of employment were tabulated in 2,740 cases, and it was found that of this number 24 were employed from 1 to 4 hours; 21 from 4 to 6 hours; 97 from 6 to 8 hours; 1,508 from 8 to 10 hours; 967 from 10 to 12 hours, and 83 over 12 hours, the hours of the housewife, of course, not being considered.

In 2,689 cases investigated it was found that the wages per day averaged about as follows: 17 received 50 cents per day or under; 159 received between 50 cents and $1; 559 received between $1 and $1.50; 539 between $1.50 and $2.00; 578 between $2 and $2.50; 808 between $2.50 and $5.00, and 19 over $5.00 per day.

The working conditions in 1,591 cases

out of 5,710 instances investigated were considered good; 3,177 cases were found to be medium, and 942 cases bad.

The kind of dwelling place was noted in 13,607 instances, and it was found that 2,671 were domiciled in separate houses and 10,936 in tenements. The Chicago ordinance makes no distinction between a tenement house (which may be roughly stated to be a building in which two or more families live, keeping house separately) and an apartment house, but in an effort to differentiate between these two classes, which are recognized in some cities, the number given may be divided approximately as 3,463 in apartments and 7,473 in tenements. I may say that the classification in the latter instance was made as to condition of building, crowding, rate of rent, a tenement being a low grade apartment house.

Housing Conditions

Kind of dwelling	
House	2,671
Apartment	3,463
Tenement	7,473
Hotel	132
Jail	202
Front	7,515
Rear	5,063
Floor	
Basement	715
First	4,325
Second	5,678
Third	2,072
Fourth	401
Attic	78
Total	13,269
Number of rooms in the home	
One	661
Two	656
Three	1,872
Four	5,901
Five	1,942
Over Five	2,665
	13,697
Number of occupants in the home	
One	503
Two	713
Three	1,230
Four	2,250
Five	2,409
Six or over	6,690
Total	13,795
Rent per month	
Under $5.00	237
$5.00 to $8.00	2,099
$8.00 to $12.00	5,585
$12.00 to $15.00	2,212
$15.00 to $18.00	1,231
$18.00 to $22.00	756
$22.00 to $25.00	237
Over $25.00	409
Owner	751
No rent	90
Jail	202
Hotel	107
Total	13,916

Classification as to sanitary conditions was as follows:

	Good	Bad	Total
Plumbing	10,109	3,800	13,909
Ventilation	9,232	4,705	13,937
Cleanliness	8,202	4,711	12,913
Garbage disposal	11,479	2,125	13,604

What does our survey show with reference to tuberculosis in these blocks? In the block bounded by Milton, Townsend, Chicago and Locust Streets, we found 90 cases of pulmonary and 133 cases of glandular tuberculosis. In the block bounded by Milton, Cambridge, Division and Elm Streets we found 68 cases of pulmonary and 123 cases of glandular tuberculosis. In the block bounded by Milton, Cambridge, Hobbie and Oak Streets, we found 20 cases of pulmonary and 26 cases of glandular tuberculosis.

The examination of the employes of some of the large business houses yielded interesting and sometimes startling information. In one candy factory where over 1,000 people were employes, examination was made of 698. Of this number 100, or 14 per cent, were found to be tuberculous—this in a candy factory which distributes its product over almost the entire civilized world. The same general conditions were found to prevail in all the candy and confectionery factories included in the survey.

We examined 1,514 employes of the United States Government in the Chicago Post Office, and found 70, or 4.6 per cent, suffering with tuberculosis. We have learned that many of the employes evaded examination for fear of losing their positions if pronounced tuberculous.

The Chicago Telephone Company's employes showed 49 cases in 520 examined, or 9.4 per cent.

The employes of every restaurant and hotel, and this includes the very best hotels in our city, showed from 8 to 20 per cent suffering with easily detected tuberculosis.

The Cook County Jail was included in our survey. The jail building is an old one, poorly ventilated, and with no sunlight penetrating to 99 per cent of the cells, which are cement cubicles, with iron grating doors.

Out of 427 regular inmates and 317 transients examined, 102 of the regular inmates were diagnosed tuberculous, and 100 cases of tuberculosis were found among the transients. All told, 27.1 per cent of the population of the jail at the time the survey was made were found to be tuberculous.

In a study of the Michigan tuberculosis survey for the twelve months from October 1, 1915, to October 1, 1916, I note that it included an examination of 11,528 people, 2,914 of whom were diagnosed as positive tuberculosis, 2,231 as "suspicious cases" and 404 as arrested cases. In other words, of the number examined, 44.6 per cent were found either tuberculous, suspicious or arrested. But in comparing these findings with those of the Chicago survey it must be borne in mind that the Michigan survey was not a house-to-house survey, but largely a clinic, or travelling dispensary, which examined only those persons who felt sick and had some reason for going to the survey clinic, while the Chicago survey was made from house to house, in a territory where three dispensaries had been located for a period of approximately ten years.

This survey has shown us where to locate our dispensaries so as to be in close proximity to the known cases, and has shown the utter futility of the old dispensary clinics standing alone, and the necessity for reorganizing the field service on an all-time medical basis instead of a part-time basis as heretofore. It has caused the board to halt in a contemplated plan of expending $600,000 for an additional hospital, and to rest upon our oars and consider whether it is wise to provide extra beds on the Sanitarium grounds for 1 per cent of our tuberculosis patients and leave little or nothing for the care of the 99 per cent left in the field.

The tuberculosis load is much more than heavy enough for our present budget, and when we consider the experience of France and England in the present war I feel that we should be ready for any emergency which may arise and have money in our exchequer to care for the extra burden which is sure to be imposed because of our participation in the war.

The conclusions which may be drawn from our survey are many, and those arrived at depend, I feel, upon the viewpoint of the individual who makes the appraisal. If I were to ask the housing expert to solve the tuberculosis problem, he would doubtless say, "The house should carry the greater part of the blame." The union labor man would tell you, "The unfairness of capital is the cause." The employer would say, "Shiftlessness." The charity worker would say, "Poverty is the cause of it all."

In looking at the housing situation I think a distinction should be made between the house, as such, and the condition in which a good house may be put to an improper use. What has the house and the vacant air spaces in the district surveyed to do with the tuberculosis found therein? The figures show that in a number of instances too many people sleep in one room; that the windows are frequently kept closed, and that the rooms are dark in numerous instances on account of narrow areaways. In a large number of instances the house was all right in all the above respects, but the house *per se* was not to blame if six or eight people slept in one room, with the windows shut and the curtains tightly drawn.

Referring to previously noted figures, it will be seen that 51.5 per cent of the cases discovered were among children under fourteen years of age. The large number of Italian children found infected, and the fact that Italians live largely upon a carbohydrate diet, and the small number of Jewish children discovered, although the survey included the Chicago Ghetto, compels me to conclude that the character of the food consumed is one important factor.

On the other hand, we must not forget that these Italians come from the warm climate of Italy, whereas a large number of the Jewish children and their forebears come from Russia, a cold climate, and just as the negro coming from the southern United States to the north becomes an easy prey to tuberculosis, just so does the Italian from sunny Italy.

A study of the amount paid for rent and the low wages received would convince many that lack of money was the root of the trouble.

It was noted that a history of measles or other contagious disease was present in a very large percentage of the children. Therefore many people will conclude that contagious diseases had prepared the soil for the infection of tuberculosis, and that infections were spread by close contact due to overcrowding. As I see it, the greater part of the tuberculosis in the district surveyed was caused by repeated infections due to close contact. This close contact was brought about largely by overcrowding in the rooms of the tenements, and by overpopulation in the district as well.

We cannot get away from the consumptive. Several millions of them are now living in the United States. The tubercle bacillus is everywhere, and we must conclude that the community free from almost universal infection is rare. Cobbett in his "Causes of Tuberculosis," just off the press, intimates that perhaps it is well that all of us should become infected with tuberculosis in small, immunizing doses, as we are now being infected. Perhaps if we were to carry our propaganda too far—clean up too much, so that there is not frequent opportunity for us to get our immunizing dose—we would soon have a race as susceptible to tuberculosis as was the American Indian in his primeval forest. Therefore it is probably desirable that we should become immunized and gain a certain measure of protection from a small dose of tubercle bacilli well resisted. These early, latent infections no doubt bestow an immunity against the effects of larger doses which one may later unfortunately experience. Too much comfort must not be derived from this, however, for in young children any degree of infection may become generalized and rapidly fatal. It is obvious that to measure scientifically our dosages against individual resisting powers is the problem to be solved by the laboratory worker and the clinician. To neglect our sanitary precautions, all our known methods of fighting the spread of tuberculosis, on the theory that its prevalence means protection, would be folly.

I plead for a control of tuberculosis through the vaccination methods used in smallpox, diphtheria and typhoid fever; a vaccination which can be measured and administered scientifically, with nothing left to chance in the size of the dosage.

But, while we may differ as to the most important contributing factor in the spread of tuberculosis, we must all agree that there is no question regarding the necessity of caring for discovered cases.

In my dual rôle as commissioner of health and member of the board of directors of the Sanitarium I have had access to much information which would not have been easily obtained had I occupied only one of these positions. In attempting to outline a plan for controlling tuberculosis, therefore, I had in mind the experience which Chicago had in 1894, when it had a terrific epidemic of smallpox, and I studied the measures adopted at that time. I had in mind the fact that tuberculosis is contagious by contact, much as measles, scarlet fever and diphtheria are. I had in mind the powers possessed by the Department of Health to regulate diphtheria, scarlet fever and other contagious diseases, as outlined in the Chicago ordinances. An opinion from the Corporation Counsel of the City of Chicago, rendered May 19, 1917, stated that the Commissioner of Health of Chicago is charged with the control of contagious diseases by such methods as may to him seem proper, and that his powers may be exercised in the control of tuberculosis as well as in cases of scarlet fever, smallpox or diphtheria.

But what are the proper methods of preventing this disease and caring for cases after they develop? What steps will be productive of most good?

We have tried education. We have had our tuberculosis exhibits, our city, state and national societies for the study and dissemination of information regarding this disease. We have no doubt that much has been accomplished by these means; but do we depend entirely upon an educational campaign for the control of scarlet fever or diphtheria? Certainly not. We find it necessary to provide hospital facilities for these diseases. We find it necessary to establish quarantine where cases remain in the home, and to lay down certain more or less stringent rules regarding the conditions to be maintained in the home.

In the control of tuberculosis, education has not sufficed, nor has the care of patients in well built and wonderfully equipped sanatoria served to make any appreciable dent in the figures showing the morbidity and mortality of tuberculosis.

But we cannot, with our newly awakened social consciousness, say to these unfortunate people, "We have told you you must do thus and so, or suffer the consequences. You have not listened to our gospel of fresh air and sunshine, good food and proper shelter, therefore you must have tuberculosis." Rather we feel that we must put forth greater effort, and, if the mountain will not come to Mahomet, then Mahomet must go to the mountain, and so I have come to the conclusion that we must go into these homes, and, by a judicious use of education and a "big stick" seek to mend the situation.

I have in mind a plan, practically the Heiser plan, which I feel might be productive of results if faithfully and consistently carried out; something along this line:

When a case of tuberculosis comes to the attention of the health authorities, a physician or a nurse should be sent to visit the patient. The patient will be advised as to the danger to his family and friends if he continues to expectorate upon the floor; of the danger to himself if he continually refuses to sleep outdoors; of the danger of over-indulgence in alcoholic drinks in his condition, and any other instruction which may be necessary in the particular case. Sputum cups will be supplied where the patient is unable to furnish them, or any other necessities of this kind which are required.

If, upon subsequent visits the nurse finds that the patient has his paper cup in his pocket, and is using it; that there are no signs of expectoration elsewhere; that at least the head of his bed is outdoors; that he apparently is following the instructions laid down not only for the protection of himself and his family, but the people with whom he mingles in his daily life, then he is permitted to remain at home and every possible aid is given him to further his recovery there.

But if, on the other hand, the nurse or quarantine officer finds that hygienic rules are not being observed, the patient is warned that further infractions will result in his being put in an ambulance and transported to the Municipal Tuberculosis Sanitarium. As I have said above, under the powers possessed by the commissioner of health we have the same right to do this that we have to hospitalize a case of smallpox.

The patient when taken to the Sanitarium is put into a cottage with other patients who are there likewise for training and education.

I believe that if every individual suffering with what is known as open consumption were apprehended and, if necessary, by force compelled to conduct himself in the sanitary manner which we compel the patients at the Sanitarium to adopt, the spread of tuberculosis would be greatly reduced.

Every consumptive who is trained to follow the rules of hygiene in caring for himself and in protecting his family and associates against his disease is one of the strongest educational elements we can place in a community.

So, when a patient at the Sanitarium has become thoroughly familiar from daily drilling, instruction and observation, with the proper way of conducting himself, he should be permitted to return to his home if he so desires.

A certain number of beds in the institution should be reserved for just the purpose of training patients to make them safe for the community.

If there are, as has been estimated, between 60,000 and 70,000 cases of tuberculosis in the city of Chicago needing sanitarium supervision and control, and but *750* patients can be accommodated at the institution under our old system, this means that but 1 per cent of the cases could be hospitalized, 99 per cent remaining in the field to disseminate infection to others. But if, under the plan proposed, a certain number of beds be reserved for "educational" purposes, and these filled by patients whose length of stay varies from one week to a month or more, a very large number of patients can be accommodated during the course of the year.

The adoption of such a plan as this would necessitate changes in the present rules of the Sanitarium, and would mean the expenditure of much larger sums of money for field work, the supplying of necessities for home care of the patient where the family is unable to furnish them, and would lead to an immense broadening of the "out-patient" department of the Sanitarium.

But it would also mean that the influence of the Sanitarium methods would be more widely distributed, among a steadily increasing number of people. I believe that it would *pay* —immediately and ultimately,—as the most effective measure which might be adopted. It would mean a more careful patient, a more careful family; it would mean that any other case which might develop in the family would be given earlier medical attention; it would mean a gradual lessening of infection; it would mean, I believe, a gradual elimination of the spread of tuberculosis.

I have little sympathy with those who counsel that we must go slowly, that the public is not yet ready for radical measures in stamping out tuberculosis, that we must educate some more, that the private physician's patient must not be brought under the control of the health authorities, that neither the doctor nor the public is ready for such a step. I ask, when will they ever be more ready? After years of preparation it seems to me that we have reached the psychological time for this "clean-up." Ten million young men are just having an audit made of their physical machinery. Specialists in every line are at work on 10 per cent of our population. The government is discarding the tuberculous as unfit, and every registration area in the United States has its quota of this class. In Chicago we are getting them and looking after them. Every other district in the United States should do the same.

What would you think of a farmer who, having a field dotted with Canada thistles, would go over it, rooting out every third, or fifth, or tenth plant, leaving the balance to reseed the field? Would we not know that his field would still be infected? Why is not the same fact true of tuberculosis? We have seen the weeding out of the tenth, twenty-fifth, or seventy-fifth case, leaving the remainder to continue to spread infection faster than it can be detected and controlled. Why is not this the time to discover, supervise, direct—by force, if necessary—the tuberculous in our midst? Let us have done with the twaddle that the community should not act against a tuberculous patient the same as it does against one with any other contagious disease! Let us tackle the entire problem; let us weed the entire field!

We have spent much time and money "educating the profession." Well, if this is a hopeless task and does not secure the desired results, why not expend our time, money and energy along a different line? Let us act with decision, do what is right, and the doctor will be educated in this manner more quickly than in any other.

I feel that the value of the requirement of a health certificate by all employers of labor is forcibly demonstrated by our survey. Should this become a general custom it ought to be of material assistance to the health authorities in their efforts to control the situation with reference to tuberculosis. The establishment of welfare departments in connection with every large business would then follow as a matter of course. Chicago has taken a step in the right direction for two years past in requiring children to present health certificates before entering school.

The great need of regular medical examination of *all* persons is too evident to require comment.

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PRACTICAL STANDARDS FOR FACTORY SANITATION.

George M. Price, M. D.,
New York City, Chairman of Committee on Shop and Industrial Sanitation, National Council of Defense.

Read before the Industrial Hygiene Section, American Public Health Association, October 17, 1917, at Washington, D. C.

THROUGH the courtesy of Dr. Evans, chairman of the Committee on Sanitation of the Council of National Defense, I was appointed as chairman of a Committee on Shop Industrial Sanitation. The function of the committee was to establish and adopt sanitary standards for factories and shops working on Government contracts.

To assist me in the formation of these standards, the following were invited to become members of the committee: Dr. John Vogt, representing the New York State Industrial Commission; Dr. Francis D. Patterson, representing the Department of Labor and Industry of Pennsylvania; Mr. John Roach, representing the Department of Labor of New Jersey; Mr. William E. Duncan, deputy commissioner of the Department of Labor and Factory Inspection of Connecticut; Dr. L. Harris, representing the Health Department of New York City; Dr. Thomas Darlington of the American Iron Institute; Dr. Walter G. Hudson of the du Pont de Nemours Company; Miss Pauline Goldmark of the National Consumers' League; Mr. William Groeniger of the Ohio State Board of Health, and Mr. Young of the American Museum of Safety.

The principles by which the committee has been guided in its work were the establishment of sanitary standards for government work in factories and workshops, that would be just to the employers as well as to the workers, that would safeguard the lives and health of the workers, without creating too great a burden upon the employers. The standards were to be neither the maximum of the possible ideal sanitary workshop nor the minimum local requirements demanded by some states and labor departments. The standards were also to fit large as well as small industrial establishments and be applicable to city as well as suburban factories and workshops.

The personnel of the committee was such as to insure efficient and just standards, at the same time conforming to the differences in legislation of the most important eastern states, where a large part of the government work is being done.

The committee, at the outset, has limited its work only to ordinary factories and workshops, that is, such establishments where there are no special industrial health hazards, where there is no appreciable amount of dust, nor any appreciable gases, fumes or poisons. These special industrial establishments were to be dealt with by a special committee.

The standards adopted were under the heads of (1) Drinking Water; (2) Washing Facilities; (3) Toilet Facilities; (4) Dressing-rooms and General Cleanliness.

Drinking Water.—The standards *in re* drinking water included not only general provisions, but also details as to location, drinking fountains, receptacles and drinking cups. The committee felt and accepted as a standard that no common drinking cups or glasses should be permitted.

Washing Facilities.—Aside from the general provisions, standards have been adopted as to location, number, floors, towels, and receptacles for soiled towels.

As to number, the standard has been adopted that there should be provided at least one sink or stationary basin with hot and cold water for every ten employees, or at least two feet of trough sink for every ten employees, or a perforated pipe with a continuous flow.

Toilet Facilities.—The standards as to toilet facilities naturally created much discussion, in view of the differences in the legislation of the various states and municipalities. The standards finally adopted contain, besides the general provisions, articles about the apartments, location, separation, screening, distance, construction, floors, walls, ceilings, light, ventilation, heating and cleanliness. Also provisions about fixtures,—kind, connections, number and ratio; also urinals,—kinds, construction, connections, number and ratio.

An interesting standard was the one relating to toilet rooms not having sewer connections and maintained outside of buildings. These were to be at least twenty-five feet distant from the building and in all factories where the workers are exposed to excessive heat, humidity, or fatigue from physical exertion, there was to be provided a covered passageway connecting said building with the toilet or toilets.

Another interesting provision was the prohibition of any form of trough water-closet, or latrine or school sink.

As to the ratio of the number of water-closets to the number of employees, the standard adopted was one closet to twenty, and where there were more than one hundred employees, the ratio was changed to six to one hundred and fifty, and one additional water-closet for each thirty additional persons.

As to urinals, the provision was that there should be one urinal for ten to thirty male employees, two for thirty to sixty, and one for each additional fifty men employed.

In reference to dressing facilities, the committee felt that it was unwise to demand separate dressing-rooms in ordinary factories where no poisonous materials, dusts or fumes are handled, and which are free from excessive heat, humidity, etc. The provision simply reads that each worker should be provided with a clean place in which to change from street clothes to working clothes. A pipe rail equipped with clothes hangers and fastened high enough from the floor to prevent the clothes from dragging is to be accepted in lieu of dressing-rooms.

With an additional general provision as to general cleanliness and receptacles for rubbish, the sanitary standards were completed.

The committee, of course, realize that the establishment of standards is but a comparatively small part in the sanitation of governmental industrial establishments. We realize that the protection given to workers in industry is not determined by the number and character of the laws or standards established and adopted, but rather by the character of their enforcement, by the efficiency of the administrative machinery and by the proper and efficient inspection and enforcement.

Fortunately, in the special Bureau of Standards, appointed by the Secretary of War for the administration of labor laws in factories doing work for the nation, an efficient and highly qualified administrative body has been created, which may be fully trusted to enforce the standards adopted by our and other committees.

REPORT OF COMMITTEE ON NON-RESIDENT DEATHS.

Wilmer R. Batt, M. D., *Chairman,*
Harrisburg, Pa.

Read and approved before the Annual Meeting of the American Public Health Association, Section on Vital Statistics, Washington, D. C., October 19, 1917.

A CONSISTENT and satisfactory method for the statistical treatment of deaths of non-residents continues to be in the experimental stage. The Division of Vital Statistics of the Bureau of the Census has made several attempts to solve this problem, none of which has been entirely satisfactory. First, because of the difficulty experienced in defining a non-resident and, second, the failure on the part of the undertakers and registration officials to appreciate the importance of full and complete replies to Item 18 on the present standard certificate of death.

In the mortality report for 1914 the Census Office presented a table showing the number of deaths exclusive of stillbirths and the death-rate including and excluding deaths of non-residents for the several portions of the registration district, based upon the following definition of a non-resident: "A person who dies in a hospital or other institution and whose previous residence is given on the death certificate as other than in the registration district in which the death occurred." It will be noted that the non-resident class under this definition was limited to certain deaths in hospitals or other institutions without regard to the length of residence in the registration district in which death occurred.

For the mortality statistics of 1915 the Census Office attempted to present a statistical table concerning the deaths of non-residents, according to the following definition: "A person who dies in a hospital or institution whose previous residence is given but who lived less than one year in the registration unit in which the death is compiled." The failure to supply the information as to the length of residence in the registration district in which the death occurred was in the aggregate so large that no statistical table was presented for the year 1915 in relation to non-residents according to the above definition.

For the mortality statistics of 1918 it is proposed by the Census Office to present a statistical table based upon the following definition of a non-resident: "A person whose usual place of abode is outside of the registration district in which he dies." And it is further proposed to present the material in the following form:

(1) Total deaths including non-residents.

(2) Deaths excluding transferable non-residents.

(3) Deaths excluding transferable non-residents and including residents who die in registration area outside.

(4) Non-resident deaths not transferable.

As this would seem to constitute the first systematic effort to reassign deaths to the locality of abode wherever possible and to make possible a comparison between transferable and non-transferable non-resident deaths, it would certainly afford an opportunity for estimating to what extent our mortality statistics are at the present time capable of refinement in reference to the deaths of non-residents. Your committee would therefore endorse the effort of the Census Office as affording a basis for more definite action in the future.

REPORT ON REGISTRATION AFFAIRS.

Wm. H. Davis, M. D.,
Chief Statistician for Vital Statistics Census Bureau, Washington, D. C.

Committee Report read before the American Public Health Association, Section on Vital Statistics, Washington, D. C., October 19, 1917.

THE death registration area now includes 26 states, the District of Columbia and 47 cities in non-registration states, and relates to 70.2 per cent of the population of the United States.

The only additions to this area in 1917 have been the following cities in non-registration states: Brunswick, Ga., Alexandria, Baton Rouge, Lake Charles, Monroe, and Shreveport, La.; and Houston and Cleburne, Tex.

Tennessee is now being tested and is expected to measure up to the required standard. Illinois will doubtless be ready soon for admission.

A new registration law, based upon the Model Law, was enacted this year in Oklahoma so that this state should soon be eligible. Texas has also improved its law and the outlook is for a gradual extension of the death registration area, but satisfactory registration of deaths in every state can hardly be expected inside of another ten years.

Early in 1917 physicians in the registration area were requested to send to the Bureau of the Census the names of their patients who died in December, 1916. In this way it has been possible to check the completeness of death registration in any state suspected of incomplete registration. Complete figures are not yet available, but enough has been done to demonstrate the value of the test.

Special agents of the Bureau of the Census have been appointed this year in North

Carolina, Mississippi, Kentucky, Ohio, Louisiana, and Virginia. These agents receive a nominal salary and are authorized to query incomplete returns for the Bureau of the Census. This plan will undoubtedly be extended gradually to other states, and should be of distinct benefit to the Bureau of the Census in that the incomplete returns will be queried monthly when they are received at the state offices, while queries from the Census Bureau cannot be made till the transcripts have been received, which may be months after the deaths occur. This shortening of the time between the time of death and the query sent out for completion of the death certificate should result in more accurate information for the final records. The state records should likewise be improved by the plan, for all additional information will come directly to the state office and the final record in the state office will always agree with the final records at the Bureau of the Census.

Birth Registration.

The birth registration area, which was established in 1915 and then included the six New England States, New York, Pennsylvania, Michigan, Minnesota, and the District of Columbia, representing 31 per cent of the population of the United States, was enlarged for 1916 by the admission of Maryland, and for 1917 by the admission of Virginia, Kentucky, and Indiana. In fact. the 1917 area will also probably include North Carolina, Ohio, Wisconsin, and Utah, and cover a territory in which dwell 50 per cent of our population.

The tests which are being made by the special agents of the Census Bureau are beyond question improving both birth and death registration very much. Immediately following the recent test in Kentucky, Dr. A. T. McCormack, Secretary of the State Board of Health, while commenting upon the great benefit of the test to registration in Kentucky, jokingly remarked that he had only one fault to find with the test, namely, that it had so stimulated death registration that the Kentucky death-rate had gone up two points.

Tests have been made this year of birth registration in the New England States by checking the deaths under one year in 1916 where the decedents were born in that year in the state against the birth transcripts on file in the Bureau of the Census. Lists of the deaths for which no birth transcripts were found have been sent to the state registrars with requests that they check up these names in their files.

The figures of the test in the Census Bureau indicate a deficiency ranging in these six states from 11 per cent in Vermont to 22 per cent in Rhode Island. But there is reason to believe that these figures will be reduced more than one-half when the state registrars make their final reports, for many births thought at first to be missing will probably be found under different spellings.

The outlook for better birth registration was never so bright as it is today. The present emergency has awakened the people as never before to the importance of this question. Indeed, the outlook is excellent for a registration area for births which within two years will include two-thirds of the population of the United States.

But even this hopeful outlook is not satisfying if a still better one is possible. Would it not be glorious if Congress would enact legislation which would make compulsory the registration of every birth. As one prominent registrar expressed it such legislation would advance the cause of birth registration "twenty years."

HOSPITAL STATISTICS AS AN AID TO PUBLIC HEALTH ADMINISTRATION—THE PHILADELPHIA PLAN.

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Read before the Section of Vital Statistics, American Public Health Association, Washington, D. C., October 18, 1917.

THE statistical method has been established as the basis of all epidemiological studies. While success rests on the interpretation of the collected data, primarily the success or failure of any study depends on the accuracy of the data. Time was when *mortality* indicated to the public the relative health of the community; time is when we regard *morbidity* as the rule by which we measure health standards. Death may indicate the failure of medical science, but sickness as certainly indicates in many instances the failure of the individual or a community to observe the proper sanitary laws.

With these thoughts in mind the Division of Vital Statistics began an investigation and review of hospital reports in Philadelphia. We aimed:

1. To obtain some concise idea as to the manner of making the reports covering both morbidity and mortality;
2. To obtain the effect of hospital administration on the fatality rate of certain diseases;
3. To aid public health administration by a definite knowledge of the incidence and location of non-reportable diseases.

A study of the annual reports from sixty-five hospitals showed the amazing fact that no two institutions employed the same nomenclature. Even the published reports of a single hospital presented a varied classification for the different departments. Hospital statistics as they exist today are of no practical value in determining the efficiency of the hospital treatment. In a like manner, the complete experience of a given institution for a specific group of diseases cannot be determined. The standardization of nomenclature and the proper presentation of data covering morbidity, as well as mortality, should be the next step in "preventive medicine." While most institutions give a complete and detailed report of donations and contributions, there are but few that offer data covering the more important facts, namely, the medical administration and statistics of sickness and death. Year by year thousands of cases are being carefully studied in the various centers of medical education. Such studies should be of service in compiling our experience covering the non-reportable disease group. However, each year sees these data either neglected altogether or compiled in a haphazard way, without following any standard method. Transmissible diseases are now being reported with at least a fair degree of regularity, but as public health officials we should urge measures aimed toward the collection of accurate data including the non-reportable group of diseases. Cardio-renal-vascular diseases, cancer, diseases of the thyroid, etc., undoubtedly, are of as much interest to the practitioner of medicine as are the epidemic diseases and the efficacy of various forms of treatment is of far greater importance to the individual than the detailed list of the hospital donations.

As an instance, the recent outbreak of influenza might be cited. During one month there were as many persons succumbed to this disease in Philadelphia as died from it during the whole of the previous year. While vital statistics showed the disease to be widespread in character, it became a question of local interest whether one particular part of the city was affected more than another; and if occupation, housing or racial influence had any bearing on the incidence of the disease, as well as the case fatality. No one was able to answer these queries. As a result, preventive and educational work could not be concentrated and data of a general character was distributed to all classes in all sections of the city. The same condition confronts the sanitarian and epidemiologist in the majority of the minor infections and non-reportable diseases.

In Philadelphia at the present time there are ninety public and private homes, not one of which includes in its annual report a statistical table covering their morbidity or mortality. Of course, it is reasonable to suppose that the mortality in these institutions is almost nil. On the other hand, certain foundlings homes would be supposed to have a high mortality rate. There are approximately eighty hospitals located in the city. A study of the latest reports from forty of the largest of these institutions showed that thirty-two or 80 per cent make some statement of morbidity and mortality, while one gives neither morbidity or mortality. Five state mortality only, while two give morbidity only with a general statement covering mortality. Twenty-three hospitals employ detailed classification of their morbidity and mortality, but no two are comparable. In many cases reports of the various departments use different nomenclature. The reports of three institutions are worthy of note. One, a psychopathic hospital, one hundred years old, gives annually a summary of all patients admitted during the past. Its statistics cover in some detail the alleged cause of disorder, age on admission, sex, occupation, civil state, duration of disorder, residence and the final results of treatment. A second hospital classifies all house patients as discharged or died in the terms of the International Classification. Out-patients are grouped variously according to the report of each service. No detailed analysis is attempted. The third institution—after a general summary of the social status, nativity and occupation of all house patients, and a further summary of diseases or injuries, number of dispensary visits and number of operations performed—proceeds to give a detailed list following the Bellevue Classification, with the corresponding title number of the International List. The classification is divided into In- and Out-Patients with the former subdivided according to staff service or non-staff. The final termination of the case is given (discharged, died or remaining) and the total number treated. This is by far the most comprehensive report issued in the city of Philadelphia.

The second factor our study endeavored to determine, *i. e.*, the effect of hospital administration and treatment in certain diseases, proved of no avail. Treatment was not divided or classed in any way to permit of intensive study.

The third point or a possible aid to public health administration by the incidence and location of non-reportable diseases was found unavailable because of the grouping of the diseases without regard for the chronology of their development, as well as because of a lack of the data concerning the patients' usual residence.

Therefore, it was demonstrated that hospital statistics fulfilled no function in the majority of instances and that disease records in such a center of medical learning as Philadelphia were arranged in a manner to make them of no assistance to the practicing physician, to the sanitarian or to public health officials.

Dr. Charles F. Bolduan, a few years ago, suggested a system of reporting morbidity statistics of hospitals.* His suggestion was that the whole system be based on a "discharge certificate" report which should be similar to the death certificate. These certificates should be supplied to hospitals and one returned by the institution to the central bureau, for each patient discharged. Then, by means of mechanical tabulation, each certificate should be transferred to a tabulation card and statistics compiled, in very much the same way as the form now employed all over the United States for the collection of vital statistics. The system herewith presented is by no means so elaborate. Frequent attempts in the past have been made to obtain detailed reporting from hospitals, but they have given no results. Our present system was readily accepted because of its simplicity and while fully realizing the inadequacy of our information for detail analysis, I believe it is all that can be hoped for as a beginning. If we obtain the coöperation of the majority of our hospitals to this form of reporting, we shall be able to train them into more detailed and intricate returns as time progresses.

Mr. Frederick L. Hoffman's treatise on "The Statistical Experience Data of the Johns Hopkins Hospital, 1892 to 1911" is of great value in formulating hospital data. While, as he suggests, the Bellevue Classification is better for medical purposes, the general method of statistical presentation, as used in the Hopkins Report, is practical and would make the enormous amount of hospital data useful to many branches of science.

In the early part of February we communicated with the Secretary of the American Hospital Superintendents' Association, asking that he introduce a resolution at their next meeting of the Local Branch, endorsing our system of collecting morbidity statistics from the various hospitals in this city. This organization represents sixty-five of our largest institutions. In accordance with the idea, on February 12, the American Hospital Superintendents' Association endorsed the "Philadelphia Plan" and urged that all hospitals begin to report monthly morbidity as suggested by the Division of Vital Statistics.

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* Hospital Morbidity Statistics, Charles F. Bolduan, New York Medical Journal, March 29, 1913.

This form follows the classification of the Abridged International List of the Causes of Death, with the insertion of the two venereal diseases and coroner's cases. The general subdivision of sex is noted with the number of cases and number of deaths by total and sex. While we realize that this is not ideal, we consider it is the beginning of a system of morbidity reports which will develop as time goes on and eventually give rise to a more complete and detailed classification.

Briefly, the plan is as follows:

The latter part of February a form letter, an instruction sheet and a vest pocket edition of the International List of the Causes of Death were sent to each hospital superintendent. The form letter contained the resolution passed on February 12 by the Local Branch of the American Association of Hospital Superintendents.

"That this body is desirous of aiding the Bureau of Vital Statistics in the correlation of the information requested on two blanks presented, and will aid the bureau to obtain such information if the hospitals are supplied with the necessary blanks."

Secondly, the letter emphasized the method of classifying deaths when there existed two or more conditions in the deceased. This followed the rules adopted by the American Public Health Association in 1909.

Thirdly, attention was called to Item 41, which, if deducted, would give a net hospital mortality.

The idea was to obtain January 1 a list of all cases remaining in the hospital, classified according to the Abridged List by sex. This applies only to the beginning of the period studied, as the residual cases for December would be already counted in the morbidity of that month and if repeated as residual cases in January would give an erroneous morbidity.

The printed form employed for this purpose had spaces for the name of the hospital reporting and the month the report covered. It also gave male cases and deaths; female cases and deaths, as well as total cases and deaths. The causes of death were to be reported according to the International List of the Causes of Death. Spaces for total of all cases and deaths according to diseases given appeared at bottom of form and below these were two lines for the name of the informant and informant's title.

Each case was to be checked in the morbidity column when a diagnosis had been made or at the end of the month. Again, these cases should be checked in event of their death. All returns were to be made to the central office promptly on the first of each month. Morbidity does not include births occurring in the institutions because they are considered healthy individuals unless they become patients by reason of some disease, in which event they are placed in the morbidity class. Births and stillbirths are taken care of on a second form which will be considered later.

You will note that no mention is made of residual cases in the hospital at the beginning of the month. It is apparent, therefore, that sometimes there may be a death and no case, or again, for individual months the case fatality would lead to erroneous conclusions. This cannot well be overcome, but a study of the year's rate will counterbalance the discrepancies of the individual months.

The advantage of classifying the cases soon after admission or within the current month will become apparent. This is done to enable the health department to trace the area of non-reportable disease prevalence. Until such a time as there is an actual zoning of hospital activities, such methods will not be accurate. However, it is reasonable to suppose that patients, especially with an acute illness, will apply to the most convenient hospital for treatment. This would mean that the morbidity report of that hospital will show the prevalence of such illness and approximately the prevalence of this form of sickness in that particular area or neighborhood. Therefore, by this means of morbidity reporting, public health officials would be apprised of the prevalence of non-reportable diseases and could direct intensive work to that particular locality.

The venereal diseases were added to the list after careful thought. There seems to be a great aversion on the part of physicians to report this group of diseases. Reluctance on the part of the doctor is not decreased by reporting such diseases by number. Frequent efforts to obtain the coöperation of various physicians in this regard have met with failure and we took this opportunity to insert the specific venereal diseases as a part of our morbidity record. To date various hospitals have reported syphilis and gonococcic infection and we are hopeful of the time when they will continue these reports with a fair degree of regularity.

In compiling the reports for hospitals in a city the size of Philadelphia, it becomes necessary for us to classify the hospitals. Two general headings are possible: first, general hospitals and second, special hospitals. The latter group might again be subdivided into Maternity, Psychopathic, Tuberculosis, Oncologic Hospitals, etc. For each of the special groups a more detailed classification referrable to their special work should be adopted. This must be worked out according to the type of institution and all such reports should constitute a separate study.

While the system was only inaugurated March the first, we have obtained reports from many of the larger hospitals and the number is steadily increasing. At the present time there are approximately twenty hospitals returning our blanks. No attempt has been made so far to analyze the statistics received, as the data available is not sufficient to draw any conclusions.

The second form which was given to various hospitals covered living births, stillbirths, abortions and miscarriages. This is an attempt by the

Division of Vital Statistics to obtain a so called "pregnancy index." It is not our purpose to check birth reporting, as that has now become a state function. We hope to obtain the percentage of hospitalized pregnant women, those who give birth to children prematurely, those who abort or miscarry. By means of this data, regarding these hospitalized cases, we hope to approximate the total number of pregnant cases within the city as well as the percentage of pregnant cases terminating before the nine months period. It has been estimated by various observers that there occurs one abortion to every four pregnancies. However we find that there is no data available on such a subject.

The printed form used for reporting of births gave the name of the hospital and the month and year of reporting. The first column covered Total Pregnant Cases, then Living Births were given according to Full Term and Premature. Still Births were classified as Full, 7–9 Months and 4–7 Months. Miscarriages and Abortions were further classified into 2–4 Months and Less Than 2 Months. Columns were given for Criminal Abortion; Therapeutic Abortion and Unsuspected Cases Discovered at D and C's. On the bottom of this form there also appeared lines for the informant's name and title.

Living births are subdivided into births at full term or those occurring between the seven and nine months period and premature births or those of less than the seven month period. Stillbirths are divided according to the period of intra-uterogestation. Miscarriages and abortions offer the greatest source of error. Some physicians define the products of three months gestation or less as an abortion. Others extend the period to the age of viability (approximately six and one-half months). The term miscarriage is somewhat confused in the mind of the average practitioner of medicine and is often used interchangeably as a synonym for abortion or premature labor. We have defined these terms as follows:

Abortion.—The expulsion of any product of conception prior to four months or subjectively before the age of "quickening." At this period the placenta is not definitely distinguishable from the remainder of the chorion.

Miscarriage.—The expulsion of any product of conception from the age of four months to the age of viability, usually considered to be about six and one-half months intra-utero.

Premature Labor.—The expulsion of any foetus from the age of viability to the full term.

Our definitions have been guided by the most generally applicable views on the subject. These definitions were submitted to the Philadelphia Obstretrical Society and their endorsement asked. From a statistical standpoint it is desirable that we have knowledge of pregnacy to aid us in various deductions concerning the puerperal condition. Why septicemia should be figured on the number of women delivered of living births or even full term living and still births, I cannot appreciate? Rates for this condition as well as other puerperal conditions should be based on the total number of pregnant women. This we hope to obtain by means of the "pregnacy index" report which is returned to the central office monthly.

In conclusion permit me to say that there is no one so severe a critic of this system as the persons who inaugurated it. However, we believe that it meets the two requirements which are necessary to the establishment of any statistical system, namely: practicability and possibilities for development. At the present time in the City of Philadelphia, hospitals have been swamped with questionnaries on preparedness and various other blanks covering data in all phases of their work, so much so that it is almost impossible to institute a new system for collecting statistics. The only system that can possibly become successful at the present time, is one that is simplicity itself, and that can be used to advantage in the annual tabulation of the institution in which it is employed. We believe this true of our present "Philadelphia Plan" and trust that it shall be the foundation for the standardization of hospital statistics, thus fulfilling the three primary results which we hoped to obtain, namely:

First.—The uniformity of reporting morbidity and mortality in the various hospitals.

Second.—To enable us to study the effect of hospital administration in certain types of disease.

Third.—To aid public health administration by the incidence of non-reportable disease, and the approximate location thereof.

STANDARDIZATION OF ANTITYPHOID VACCINE.

George W. McCoy, M. D.,
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THE brilliant results from the use of antityphoid vaccine, in the military establishments of this and of other countries, have led to the use of this prophylactic in civil life. The results seem to have been less uniformly satisfactory among civilian than among military populations, though on the whole there is no doubt that the agent has proven of great value.

The early disappointments following the use of the vaccine are believed to be largely attributable to faulty preparation, and some recent experiments have convinced us that the antityphoid vaccine in use in this country has not been as uniformly satisfactory as it might be.

It is not established that any laboratory test now available is a trustworthy criterion of the immunizing power of a vaccine when used in the human species. However, we do know that the vaccine which has proven so satisfactory in protecting large groups of soldiers from typhoid gives very definite antibody response when used to inoculate rabbits.

It is conceivable that a vaccine which failed to give any response in rabbits might be effective in immunizing man; but the proof would have to be as convincing as that which can be adduced in favor of the agglutinin-producing vaccine.

Thus far our work has been done with the usual vaccine; such modifications as sensitized vaccines, serobacterins and mixed vaccines have not been taken up.

We selected the comparatively simple agglutination test in preference to more complicated serological tests because it was believed that the results of different workers would be more readily comparable, and from the evidence at hand no other procedure seemed likely to give more dependable results. Protection tests, which are always so convincing, were not regarded as practicable with the typhoid bacillus on account of the irregularity and uncertainty of its pathogenic action on lower animals.

There are several points to be considered in connection with the practical application of a standard for the product, they are:

(1) *Effect of various doses:* One of the first problems that presented itself was whether accuracy of dosage was essential, as it is in, for example, the testing of antitoxic serums. The experiment showed that no such accuracy was required as half of a dose or a tenth of a dose gave about the same response as did the full doses—500,000,000 organisms followed by two doses of 1,000,000,000 organisms.

(2) *Mode of inoculation:* Intravenous inoculation was found to give much more rapid agglutinin formation and higher titers than did the subcutaneous route but we lost so many rabbits that the latter method seemed preferable.

(3) *Spacing:* From the manufacturer's viewpoint it is important to know how rapidly the test can be carried out. Some work on this point showed that the vaccine may be given to rabbits at a single dose, 2,500,000,000 organisms, or the doses may be separated by one or three days, and secure a response about as great as when a week or longer separates the doses. When given in a single dose or in three doses at intervals of twenty-four hours, the animals may be bled after eight days. When the interval between doses is three days the bleeding may be done after five days. In either case the testing may be finished in not more than eleven or twelve days.

(4) *Variation in rabbits:* Rabbits react variously to the vaccine, hence it was found necessary to use three on each sample. The variation did not seem dependent on the amount of antityphoid agglutinin normally present in the serum of some rabbits.

Technique: The conclusion was reached that each lot of new vaccine should be tested in comparison with a known satisfactory product.

For the agglutination we use the living twenty-hour Rawling culture suspended in physiological salt solution. The density of the suspension is about the same as that of the vaccine.

The serum is diluted so as to give dilutions of 1: 25, 1: 50, 1: 100, 1: 200, 1: 400, 1: 800, 1: 1600. This is mixed with an equal volume of the suspension of the organism, shaken and placed at 37° C. for one hour. The readings are made the next day, the tubes having been kept in the cold room over night.

By always running a control, differences in technique such as density of suspension, age of culture, time of readings, temperature at which reaction is performed and other circumstances which possibly affect the reactions may occur without invalidating the test.

The Hygienic Laboratory will furnish a small amount of vaccine for control purposes to manufacturing laboratories, on application.

The experimental work with vaccines made by city or state laboratories and that made by commercial laboratories showed variations that were entirely inconsistent with the belief that all had been made with the same care or that all were equally useful as immunizing agents.

I would like to suggest here that the manufacture of these agents is not such a simple procedure that it may be taken up without proper equipment including skilled assistance. The vaccine made by one state laboratory was found to be inert and was seriously contaminated with living micro-organisms.

THE NEED FOR A GENERAL SYSTEM OF SANITARY SUPERVISION OF INDUSTRIES IN TIMES OF WAR.

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Read before the Industrial Hygiene Section of the American Public Health Association, October 17, 1917, at Washington, D. C.

THE great principle of the Great War is acknowledged to be attrition. Endurance is practically all that counts. Capability of maintenance rather than brilliancy of campaign is the principle underlying victory. Furthermore, the state of war is the normal state for the world at present, and indications are that such will be the case for some years to come. In all of this situation we see that producers have a mighty task before them in competing with consumers who are in turn vying with destroyers. Already there is a serious shortage of man-power in the world which is most acute not at the front but at home—at home in the industries.

As sanitarians and students of the principles of the conservation of health, we are confronted by a double question, the first part of which is an old one, "Are lives being saved and deaths deferred?" but the second part of which is much newer, "Are we getting maximum physiological production, or are we, in our patriotic hue and rush, getting less than this and perhaps also incurring pathology?" The increase in the prevalence of industrial accidents and diseases, I am sorry to say, attests to the latter. We are taking new types of workers—women and juveniles—into industry. In spite of warnings and entreaties some industries and some sections of the country are relaxing standards. Others, again, longer experienced, as at Bridgeport, Connecticut, after trying the relaxation methods in regard to hygienic standards, have discovered the fallacy and have already developed communities which, for output and maintenance, if we can believe published reports, are becoming models for the balance of industrial America. We are putting new classes of workers into every corner of the country and into new industries, as, for instance, is evidenced by the migrations of the negro to the North. Coincidently the various charities, private and public, report an enormous increase in their burdens, drawn largely from the industrial centers. Inability to work is more pauperizing today than in periods of hard times. Thus we see that it is necessary, if we are to come out assuredly victorious, to call in our consultants at once and inquire of them for proper modes of procedure.

Efficiency in industrial service demands strict measures of sanitation just as does efficiency in military service. The great need is maximum output in all our industries, or, negatively stated, avoidance of waste. It must be made known as loudly as we can shout it that sanitation and hygiene are basic items in *absenteeism, labor turnover, defective output* and *decreased production.*

Now is not the time to give further heed to proclaimers who call for more experiments or more evidence. The past several years, and, indeed, the past several months, have more than established these. A representative of one ammunition firm in Dayton recently attested over his signature that the application of a single suggestion from the State Department of Health regarding ventilation had not only terminated previous health catastrophies, but had jumped the output of the plant 10 per cent forthwith. There have been enough standards established, tried out and found sufficient to be applicable to the whole general industrial field. No doubt, of course, many other important items in industrial sanitation will bob up to be solved during the war, just as surgery, in some relations, for instance, is being quite revolutionized.

The educational value of a general system of industrial sanitation, made nation-wide, can be calculated to be immense; where few now have knowledge, hosts will have it within a few months. Here again we have a lesson from military methods in the matter of training. Such methods educate whole masses quickly, and most thoroughly. Lessons from this war's experience in industrial hygiene will be of immense value in the days after the war. With the troops back home and the workers experienced, community ignorance will no longer exist to passively tolerate typhoid fever and diseases due to lack of education in the principles of hygiene. We have but to get started at once in our American industries to bring this end about. Why wait for wholesale evidences of decreased production due to fatigue, staleness and sickness as was the case in England's first year or two of the war?

Nor is this the time for haphazardness. The tried-out standards of leading plants—those of *highest efficiency on steady man-power*—are none too good for all plants and for all industries. We have not time either, in anything concerning the war, for various states or localities or industries to fix upon what must and will amount to a multiplicity of doubtful methods. Standards and regulations now should be similar everywhere, for like conditions.

The need of an extension of insurance to cover sickness and invalidism as just passed by the National Congress for our soldiers and sailors, is also great for the soldiers of the factories and mines, and particularly is this so in connection with our multitude of employes in small establishments who cannot handle this intricate problem of themselves. We know that nothing reduces preventable afflictions more than establishing some form of compensation against them, since this increases inquiry and such raises the standards for sanitation and hygiene.

I cannot take the time to state what a general system of sanitation should include, except to summarize briefly what it must include: (1) A statement of the type of worker to be employed for the given job and how that kind of worker is to be secured and stabilized; (2) a declaration covering personal hygiene; (3) a system for the prompt care and recovery of those taken sick—including the proper handling of communicable and "common-cause afflictions," those afflictions of geometrical progress—and a means of sustenance until well; and (4) a declaration of sanitary regulations for the work place and the living place, devised to suit our prime war industries first off and our secondary industries immediately thereafter.

In conclusion, I am privileged to state and pleased to announce that, thanks to the foresight of far-seeing individuals, the essential features of this general system have been worked out by a number of committees of qualified persons, largely members of the American Public Health Association, who have been industrially, and practically silently, at work for months upon plans and details for procedure in this national efficiency emergency. At the various sessions of this Annual Meeting many of their principal findings will be voiced and an opportunity given for your valued opinions in regard thereto. Indeed, I am not superseding the facts in the case when I say that at the close of these sessions we trust most of this planning and detailing will be in shape for its immediate presentation to the proper governmental authorities.

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REPORT ON THE VISUAL ACUITY OF THE MEMBERS OF THE CORPS OF CADETS, AT THE MILITARY TRAINING CAMP, PEEKSKILL, N. Y.

Frederic A. Woll, Ph. D.,
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AT THE recent Camp of Instruction for boys of the State of New York between sixteen and nineteen years of age, held under the direction of the Military Training Commission of the State of New York, the visual acuity of each cadet was taken. The object was to discover how many of the cadets had normal vision; how many abnormal vision; how many were wearing correcting lenses; how many needed correcting lenses; and of what service the Commission could be to the cadets by offering suggestions and advice relative to the proper and wise care of their eyes and eyesight.

It was possible to make only a simple subjective test, and for that purpose the regulation Snellen Test Types were used, and at a distance of twenty feet. The records conform with the methods of recording visual acuity used by the United States Army and Navy.

It may be of interest to offer here an explanation of that method to those who are unacquainted with it. One's eyesight or visual acuity—the ability to see certain sized letters at the given distance of twenty feet—is expressed by such fractions as 20/20 or 20/40. The fraction 20/20 indicates that the person tested stood at a distance of 20 feet (the numerator), reading the line that should be read at 20 feet (the denominator). The fraction 20/20, therefore, indicates perfect vision. The fraction 20/40 indicates that at 20 feet the person tested was only able to read the line that should be read at a distance of 40 feet. The fraction 20/40 indicates imperfect vision.

The fraction 20/100 indicates that at 20 feet it was possible to read only the line that should be read at 100 feet.

To recapitulate, the figures above the line indicate how far the person was from the test chart; the figures below the line indicate the line which was read on the test chart.

The service requires for the "line" a visual acuity not less than 20/40 in the right eye and 20/100 in the left. For other branches of the service the standard of visual acuity is lower. The hospital service, for example, accepts 20/70 for each eye if correcting lenses bring the vision up to 20/40 in each eye.

The number of cadets in each company registering 20/20 in each eye are shown in the following table:

Company	Cadets	Company	Cadets
A	102	G	107
B	87	H	103
C	96	I	94
D	97	K	97
E	92	L	95
F	101	M	100
Total			1,171

The number of cadets in each company having a slight defect in one eye or in both eyes, but who were able to pass the visual requirement for the "line" are shown in the following table:

Company	Cadets	Company	Cadets
A	9	G	14
B	21	H	16
C	18	I	9
D	13	K	9
E	19	L	9
F	12	M	8
Total			157

Each cadet in the above group was given a brief review of his case and instructions relative to the proper hygiene of his eyes.

The number of cadets in each company having a marked defect in one or in both eyes, wearing glasses, but without them were unable to pass the visual acuity test, are shown in the following table:

Company	Cadets	Company	Cadets
A	19	G	9
B	25	H	15
C	13	I	12
D	17	K	9
E	14	L	14
F	13	M	12
Total			172

Each cadet in the above group was given eye hygiene instruction as a member of either one of the two following groups.

The number of cadets in each company who had a slight or a marked defect in one or in both eyes, but which were corrected to normal by glasses are shown in the following table:

Company	Cadets	Company	Cadets
A	8	G	11
B	15	H	14
C	10	I	15
D	7	K	9
E	5	L	6
F	5	M	6
Total			110

Each cadet in the above group was given definite instructions concerning his eye habits and advised to carefully carry out any instructions that had been given him by his eye specialist.

The number of cadets in each company who had slight or marked defects in one or in both eyes, wearing glasses, but which did not correct their vision to normal, are shown in the following table:

Company	Cadets	Company	Cadets
A	10	G	2
B	11	H	4
C	10	I	2
D	7	K	2
E	6	L	3
F	3	M	2
Total			62

The cadets in this group were each given special and definite instruction relative to their eye defects. The eyes of some in this group had not been examined for periods of time ranging from two to eight years. Others had ill-fitting frames. Some probably never could be given normal vision. All, however, were given individual explanation of their defects and carefully instructed in regard to the hygiene of their eyes.

The number of cadets in each company who had visual defects in one or in both eyes, were unable to pass the visual acuity requirements, and were not wearing glasses, but who were in need of them, are shown in the following table:

Company	Cadets	Company	Cadets
A	9	G	8
B	9	H	10
C	7	I	1
D	11	K	4
E	8	L	7
F	13	M	11
Total			98

Each cadet in this group was given personal and careful instruction relative to his defective vision. Each was made to understand clearly that it was necessary to wear correcting lenses at once for the benefit of his eyes, himself, and his future.

SUMMARY.

	Cadets	%
Total Number Examined	1,598	100.
Passing visual requirements	1,328	83.1
With normal vision	1,171	73.3
With slight defects	157	9.8
Cadets Below Visual Req.	270	16.9
Wearing glasses	172	10.8
Needing glasses	98	6.1
Cadets Wearing Glasses	172	100.
Vision corrected to normal	110	64.0
Not corrected to normal	62	36.0
Receiving individual instruction	427	26.7

CONCENTRATION OF GLUCOSE AND LACTOSE AND VIABILITY OF COLI-LIKE BATERIA.

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Read before the Laboratory Section, American Public Health Association, October 19, 1917, at Washington, D. C.

PRESCOTT AND BAKER, 1904, observed that in dextrose broth fermentation tubes the number of *Bacillus coli* reached a maximum in sixteen to twenty-seven hours after which they died off, being supplanted by the sewage streptococci.

Clemesha in 1912 found that in peptone, bile-salt, neutral red media, containing one per cent glucose or lactose pure cultures of *Bacillus coli* and *Bacillus aerogenes* began to fall off in numbers after 24 hours.

In a private communication, Dr. Joseph Race of Ottawa, Canada, points out that in a medium containing 1 per cent peptone and lactose and one-half per cent bile salts, *Bacillus coli* is overgrown by *Bacillus aerogenes*-like forms so that after 48 hours incubation at 37 degrees C. the latter may be 18 times as numerous as *Bacillus coli.*

This rapid death of *Bacillus coli* in 1 per cent carbohydrate media raises the question as to the desirability of employing so large an amount of sugar in the presumptive test, particularly if it is to be used also for preliminary enrichment. In the following study it was attempted to determine in a general way the effect of concentration of glucose and lactose on the longevity of coli-like bacteria. Four organisms were employed in the experiments; *Bacillus communis, Bacillus communior, Bacillus aerogenes,* and *Bacillus cloacae.* Small quantities of 24 hour broth cultures were added to the media which had previously been warmed to 37 degrees C. The medium employed contained one-half per cent Witte's peptone and one-half per cent dipotassium phosphate in distilled water, to which was added, just prior to inoculation, the desired quantity of sterile carbohydrate. The following concentrations of glucose and lactose were tried: 0.3 per cent, 0.5 per cent, 1.0 per cent, 2.0 per cent, and 5.0 per cent. After definite periods of incubation, at body temperature, the number of viable organisms was determined by the dilution method using dextrose broth fermentation tubes to eliminate, as far as possible, errors due to contamination.

Experiments with Glucose.

The rate of growth of all organisms tested seems to be unaffected by the concentration of glucose. The number of organisms reaches a maximum of 100 to 1,000 million per cc. in about ten hours.

In 0.3 per cent glucose all of the organisms studied were undiminished in numbers after 168 hours (7 days).

In 0.5 per cent glucose *Bacillus aerogenes* and *Bacillus cloacae* persisted in undiminished numbers throughout the experiment. *Bacillus communis* began to die off after 96 hours; falling to 10,000 per cc. in 168 hours (7 days) and to only 10 per cc. on the 8th day (192 hours). *Bacillus communior* is more sensitive and death begins after 48 hours; the number of viable organisms dropping to 10,000,000 in 96 hours (4 days) and to only 100 per cc. in 168 hours (7 days).

The results in 1 per cent glucose were similar to those obtained with one-half per cent, except that fecal forms, *Bacillus communis* and *Bacillus communior* succumb much more quickly. The strain of *Bacillus* *communior* observed was particularly affected showing a count of 100,000,000 after 24 hours which fell to less than 10,000 in 72 hours, and sterility was obtained in five days.

With the higher concentrations of glucose, death began even earlier and the rate of death seemed slightly increased but there is no appreciable difference between the effect of 2 per cent and 5 per cent glucose.

The observations on glucose may be summarized as follows: The numbers of viable organisms reaches a maximum in about ten hours. For *Bacillus aerogenes* and *Bacillus cloacae* this number remains practically unchanged for seven days if the concentration of glucose is not over 2 per cent: *Bacillus communis* and particularly, *Bacillus communior*, however, begin to die off in twenty-four to forty-eight hours if the concentration of glucose is more than one-half per cent.

Experiments with Lactose.

The studies with lactose were analogous to those with glucose. The same percentages of carbohydrate were employed and the technique was unchanged. The experimental results were more variable with the disaccharid than with glucose and this was particularly noticeable with *Bacillus aerogenes*. The rate of death of *Bacillus aerogenes* is much greater in a medium containing lactose than in one containing the same concentration of glucose. *Bacillus communior* and even *Bacillus communis* die off somewhat more rapidly than *Bacillus aerogenes*. The effects of increased concentrations of lactose are similar to those observed with glucose.

As the concentration of glucose and lactose increases the time which elapses until the bacteria begin to die off decreases, and after mortality begins, the rate of death is slightly greater with the higher concentrations of carbohydrates. This latter observation needs further detailed study. An explanation for the phenomenon has not been definitely obtained. It is believed, however, that in the higher concentrations of carbohydrates the limiting hydrogen ion concentrations are more quickly reached thereby causing death of the microörganism to begin earlier. It is also possible that the hydrogen ion concentration is a function, not only of the organism, but also of the fermentable substrate and that it is slightly higher in the higher carbohydrate solutions, thus causing a more rapid destruction of the bacteria; but whether or not this is actually true has not been experimentally determined as yet.

Conclusions.

The results of these preliminary studies confirmed the observations of Prescott and Baker and of Clemesha that *Bacillus coli* dies off rapidly in a medium containing 1 per cent of either glucose or lactose and also the observations of Race that after 48 hours incubation at body temperature the Voges-Proskauer positive or Methyl Red negative coli-like bacteria are likely to predominate over the true coli forms.

In media containing 1 per cent glucose or lactose, an incubation period of 48 hours is detrimental to the successful isolation of *Bacillus coli*. This is particularly true if *Bacillus cloacae* is present. It therefore seems desirable that the concentration of lactose, in preliminary enrichment media, should be reduced to one-half per cent which is sufficient for the purpose of the presumptive tests. Isolation or confirmatory tests should be performed as quickly as convenient, preferably in from twelve to twenty-four hours.

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THE ANNUAL MEETING.

The Executive Committee have decided to make the central theme of the 1918 meeting the conservation of the health of the civilian population as a war measure.

The 1917 meeting was devoted to the development of the program for the maintenance of the military forces in war time. Surgeon-generals Gorgas and Braisted met with us and told of their plans. Doctors Trask and Frost informed us of the part in the military program that the Public Health Service and American Red Cross were playing. Each section had its program of military hygiene in which the surgeons of the Army and Navy participated. The military forces have the right of way and we made no mistake in contributing the 1917 meeting to their service.

To win a modern war it is necessary that a nation in its entirety should organize. Contests are no longer limited to armies. To win this war we must maintain the strength and morale of the civilian population as well as of the military forces. In July, 1917, the Germans reported that they had had a little more than one million soldiers killed in action. There are some sections of the civilian population with a death-rate as high as that. In the three years more than three times that many of the civilian population died from natural causes. Even in the deadliest of wars a nation can go through a strife lasting ten years without suffering from a material reduction in population through men killed in action. The greatest source of decrease in population is diminution of the birth-rate. The figures for Dresden are: 1903—births, 15,423; deaths, 8,570; excess of births over deaths, 6,853. 1915—births, 7,371; deaths, 6,406; excess of births over deaths, 965. Unquestionably the birth-rate in 1918 is far lower than that in 1915. The reports from Germany entire would be equally as bad.

It is important that the morale as well as the numerical strength of a nation shall be maintained. I have no doubt of the valor of our soldiers nor of the maintenance of their health. I do have some doubt of the willingness of our people to withstand the calls that will be made on them. I have very serious doubt of our willingness to go on a basis of health conservation comparable with that of food, fuel and transportation conservation. We are being told that our cause is being seriously imperilled by our lack of ships, arms, munitions and food supplies. We are told that the shortage in these is due to shortage in labor.

For a few years just prior to the war we gained in population by excess of immigration over emigration at the rate of about 1 per cent a year—1,000,000 gain. We gain in population by excess of births over deaths at the rate of about 1 per cent—1,000,000 a year. Our industries, commerce and agriculture is based upon an expected increase of 2 per cent a year in population. One per cent of this has been cut off entirely. When we plunged into war we took nearly 2 per cent of our population and more than 2 per cent of our labor and converted them into soldiers. Naturally there is a shortage of labor.

Is there anything that can be done about it? The various health surveys that have been made show that more than 2 per cent of our population are at all times away from work because of illness. Of those that are able to work a large percentage work at low efficiency because of minor illnesses and disorders. To gain the labor necessary to acquit ourselves creditably there are several things that may be done but none is more logical, none represents so little of revolution in method, as health conservation.

In planning to eliminate waste it is highly desirable that we plan to eliminate some of the waste from preventable illness. The plan is to have some programs of the general meetings and also some of those of the sections cover programs of demography for the civilian population. The general theme will be the maintenance of the numbers and the efficiency of the civilian population.

W. A. E.

THE SANITARY RESERVE BILL.

Senate Joint Resolution No. 63, to establish a reserve of the Public Health Service, was passed by the Senate June 18, 1917, and favorably reported by the Committee on Interstate and Foreign Commerce in the House of Representatives August 30, 1917. On March 4, 1918, it was stricken from the unanimous consent calendar upon the objection of Mr. W. H. Stafford of Wisconsin. It is now pending in the House of Representatives, being on the calendar of the "Committee of the Whole House on the State of the Union" and will probably be brought up for consideration when the Committee on Interstate and Foreign Commerce gets the call on calendar.

This resolution received the approval of the Conference of State and Territorial Health Officers at their meeting held in Washington, D. C., April, 1917, and the approval of the Conference of State and Provincial Boards of Health. The Medical Section of the Council of National Defense referred it with favorable recommendation to the Council of National Defense which recommended its enactment by Congress.

The purpose of the legislation is (1) to effectively coördinate the activities of national, state, county, and municipal health organizations; (2) to provide for the temporary appointment of additional highly qualified sanitarians in the national health organization to meet from a health standpoint the unusual situation incident to the war; (3) to fix the status of certain officers already in the Public Health Service in order that their services may be more advantageously utilized and coördinated with the services of the temporary appointees; and, (4) to provide certain additional duties in the sanitation of ports and places in their civil relations to the mobilization of military and industrial forces.

The passage of this resolution is of the greatest importance at this time. Reasonable measures for safeguarding the health of the people are important at all times but of the greatest importance in times of war when physical fitness means so much to success. Some of the reasons for greatly increasing the civilian health forces may be mentioned as follows:

With an increase in the civilian health forces, as contemplated by this resolution, the federal, state and local health authorities may more effectually meet the increased demands which are being made upon them to protect the country from the spread of communicable diseases incident to the assembling of thousands of men from different parts of the country in camps and training stations. The immediate enactment of the legislation contemplated in this resolution is necessary in order that the organization required may be effected in time to minimize the chances of the development of serious conditions incident to summer season around national camps and shipyards.

In addition to providing funds necessary for disease prevention work Congress should bear in mind that the provisions made in the resolution for commissioning health officials in the Public Health Service Reserve are necessary under present conditions of organization and discipline in order to obtain the same degree of efficiency and obedience to orders as exists in military organization. Inasmuch as the officers of the civil sanitary reserve corps are often associated with officers in the Army and Navy, the necessity for giving them civil commissions of related rank is obvious. The operation of the resolution is limited to the period of the war. Its enactment is in the nature of a military necessity.

A. W. H.

TRAINING FOR PUBLIC HEALTH.

The director of a public health laboratory who was in search of an assistant recently complained that while many applicants were well trained in chemistry, but few were familiar with the bacteriological and pathological examinations which are part of the routine work of public health laboratories.

It is to be regretted that the study of bacteriology has not as yet found its way into many general university courses. Since this subject is intimately connected with the events of everyday life, the time will probably come when bacteriology is as frequently found even in high school curricula as physics, chemistry or general biology. From general bacteriology to pathogenic bacteriology will then be a short step.

It is encouraging to note that professional training facilities in public health are making rapid progress. Many of our readers will probably be surprised to learn that there are now about a dozen schools for health officers in this country. At least one of these gives a correspondence course.

An article in one of the coming issues will review this subject in detail.

A. W. H.

Association News.

By A. W. Hedrich, Secretary.

Next American Public Health Association Meeting at Chicago.—At a meeting of the Executive Committee, held at New York City, on March 22, it was voted to hold the next annual meeting of the Association at Chicago, Illinois, October 14–17, 1918, inclusive. It was felt necessary to select a city easily accessible to a large number, and Chicago meets this requirement admirably. The last meeting of the Association held in Chicago was that of 1893.

The central theme of the meeting will be "The Health of the Civilian Population in War-Time." At the Washington meeting attention was centered upon the health of the military. Many agencies, official and voluntary, are now working to protect the health of the soldier, and it is proper that we should make an intensive study of the health problems of the stay-at-homes and strive to solve them.

Program chairman of the Sections are requested by the Executive Committee to shape their programs with this object in mind.

*

Meeting for Board of Directors.—The Executive Committee deems an early meeting of the Board of Directors necessary, and has asked the Secretary to ascertain how many Directors could attend a meeting at Chicago at the time of the convention of the American Medical Association, June 10–14, 1918.

The Executive Committee voted to present at the next annual meeting a resolution urging that expenses to the meetings of Directors be paid by the local boards of health represented. The justice of this stand requires no argument.

Some of the projects which should be considered by the Directors are: the revision of the constitution, the determination of new propaganda work, the organization of state health societies and especially a plan to increase the membership of the Association.

A list of the Directors is given on page 313 of this issue.

*

The Membership Drive.—Provisions are being made for conducting a membership campaign in a small district as a basis for the national campaign which is contemplated for the near future.

The statistics which are available indicate that there are in this country and Canada over 20,000 public health workers to whom membership in the Association holds forth great advantages. At present we have only 1,700 members.

For the great drive by our members which will come later, it is planned to divide the country into districts—possibly twenty or thirty each in charge of a district campaign manager. The directors of the Association will make nominations for campaign managers, and volunteers are also called for.

The next issue of the Journal will give further details.

HELP WANTED.

In order to help relieve the shortage of sanitarians due to the war, free help wanted announcements will be carried in this column until further notice. Copy goes to the printer on the first of each month.

In answering keyed advertisements, please mail replies separately.

The Health Employment Bureau also sends lists of applicants to prospective employers without charge.

Wanted: Recent graduate of Class "A" medical college, with training in bacteriological and serological work for laboratory work in large and reputable manufacturing company in Middle West. Address C. L. E. No. 118, care of this Journal.

The United States Public Health Service is greatly in need of the services of competent sanitarians, particularly medical officers, sanitary engineers and scientific assistants. Salaries vary from $1,800 to $2,500 per annum. Applicants should address Surgeon General, United States Public Health Service, Washington, D. C., stating in full experience and training which they have had. Mention this Journal.

Wanted: Public health nurse in Minnesota. Salary, $75 to $80 per month with increase. Address H. L. No. 117, care of this Journal.

Wanted: Assistant bacteriologist and pathologist for the South Dakota State Health laboratory. Graduate in medicine preferred. Must have had some special training and experience in the above lines of work. Give details of training and experience in first letter. Salary, $1,600 per annum, with rapid financial advancement upon demonstration of ability. A good live assistant not afraid of work is needed. Address Mortimer Herzberg, M. D., Director, Vermillion, S. Dak.

Wanted: General inspector of food handling establishments in Southern state for scoring and inspection of restaurants, markets, grocery stores, and soda fountains. Salary, $1,500 per year. Address A. A. C. No. 111, care of this JOURNAL.

Wanted: Chief for the Bureau of Vital Statistics in South Atlantic State. Salary, $2,400. Address C. H. W. No. 115, care of this JOURNAL.

Wanted: Whole-time health officer in Texas city who is competent as a bacteriologist to at least analyze water and milk and advise as to treatment of water. A man of some experience in this line and of undoubted administrative capacity desired. Salary, $150 per month. Address W. P. A. No. 114, care of this JOURNAL.

Wanted: Superintendent of nurses in Middle West City of 35,000 for welfare work. Should be capable of tactfully meeting all conditions in the district and of directing several nurses. Salary, $150 to $175 per month with increase. Address L. H. G. No. 116, care of this JOURNAL.

Wanted: Young man to help with routine city public health work in New York State, also during two months of year, half a day, to teach elementary bacteriology in medical school. A man physically disqualified for military service preferred. Salary, $1,500. Address O. T. No. 113, care of this JOURNAL.

PERSONAL NOTES.

Mr. E. Mayo Tolman, of the State Health Board, Charleston, W. Va., has obtained a leave of absence for three months to go to Guatemala, under instruction of the American Red Cross, to engage in reconstruction work made necessary by the recent earthquake.

Dr. Millard Knowlton of Boston has been appointed captain in the Medical Reserve Corps of the United States Army.

Mr. Franz Schneider, Jr., former Associate Health Editor, *The Delineator*, New York City, has been appointed a captain in the National Army. He has been assigned to duty in the Statistics Branch, Executive Division, General Staff Corps.

Mr. C. R. Newell, of Ripley, N. Y., has been commissioned a First Lieutenant in the Sanitary Corps of the National Army.

⁂

The following applicants have been elected to membership in the American Public Health Association in March 1918:

Louis Wm. Allard, M. D., Billings, Mont., Physician and Surgeon, Full-time Health Officer.

Richard E. Lee, Sc. D., Meadville, Pa.

John K. Gore, Prudential Insurance Co., Newark, N. J., Vice-President.

Gardner S. Williams, Ann Arbor, Mich., Civil, Hydraulic and Sanitary Engineer.

Annetta J. Nicoll, Topeka, Kansas, City Bacteriologist and Chief Food Inspector.

John W. Tapper, Lynn, Mass., Chairman, Board of Health.

Grover C. Goodwin, M. D., Florence, S. C., Health Officer.

Clay Products Association, Chicago, Ill. (Corporate Membership).

Lucian N. Yost, B. S., Ph. G., M. D., Fairmont, W. Va., County Health Officer.

Dr. Edward E. Johnson, M. D., San Francisco, Cal., President of Pacific Wassermann Laboratories, Professor of Serology and Laboratory Diagnosis, College of Physicians and Surgeons.

P. A. Van der Meulen, Ph. D., Philadelphia, Pa., Research Chemist.

Camille E. Dorisy, Seattle, Wash., Sanitary Engineer.

H. H. Brinkerhoff, M. D., Jersey City, N. J., Director of Medical Inspection, Public Schools.

Wm. H. Chase, M. D., Cordova, Alaska, Assistant Health Commissioner, Alaska.

G. E. P. Wright, Pittsburgh, Pa., Safety and Sanitary Engineer.

Robert H. Riley, M. D., Cumberland, Md., Deputy State Health Officer.

Louisa E. Perritt, R. N., Globe, Arizona, Instructor in Hygiene, Public Schools.

Wm. T. Scarboro, D. V. M., Winston-Salem, N. C., Dairy and Food Inspector.

Harvey G. Elledge, M. A., Pittsburgh, Pa., Industrial Chemist.

Leslie B. White, Little Rock, Ark., Bacteriologist.

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Books and Reports Reviewed.

Examination of Milk for Public Health Purposes. *By Joseph Race, City Bacteriologist and Food Examiner, Ottawa, Chairman of Committee on Standard Methods of Analysis of Canadian Public Health Association. Member of Committee on Municipal Food Administration; American Public Health Association. New York, John Wiley & Sons, 1918. Price, $1.75.*

This little book of 224 pages lives up to its intention of being a practical handbook for those engaged in the chemical and bacteriological examination of milk for public health purposes. Instead of attempting to cover the whole field of milk production, handling, control and examination, this volume frankly deals with the methods of examination, prefacing these methods only by such facts as are necessary and condensing these into very brief form. The first chapter deals with the constituents of milk and the normal composition of milk, presenting in 65 pages a general summary of the most important facts which have been brought out in the many years that milk has been under investigation, on the composition of milk and the influence of various agencies upon it. In this statement unusual emphasis is placed upon the occurrence in the milk of enzymes and immune bodies, and the importance of these biological constituents is very clearly set forth. These chapters end with a brief but excellent statement of the author's views on milk standards. The third chapter deals with the chemical examination of milk and presents in very practical and brief form the numerous methods for analysis for fats, proteids and serum. A portion of the chapter deals with the detection and estimation of preservatives and coloring matters. The enzymes again come in for treatment and methods are explained for the determination of the reductase, peroxidases, catalases and other enzymes which the author asserts are always present in normal milk. In chapter four less than twenty pages are devoted to the bacteria in milk and in this small compass the most important information for the public health student or official is given. The next chapter deals with the enumeration of bacteria in milk and presents a variety of methods including the so-called Standard Method of the American Public Health Association. The sources of error of the methods now in use are pointed out and in many instances suggestions are given for the reduction of the error to a minimum. Chapter six, dealing with excremental organisms, takes up the numbers of the *B. coli* group, *Bacillus enteriditis sporogenes* and the streptococci of fecal origin. In this chapter several methods, which have been developed by the author and which are probably not widely used elsewhere, are described, especially a method making use of an agar medium containing neutral red and bile salts. Then follows a chapter on pathogenic organisms in milk in which the streptococci of diphtheria bacillus, typhoid bacillus and tubercle bacilli are treated. A brief chapter considers cells, dirt and debris and points out the extent to which the cells may be regarded as normal constituents of milk and the methods of examination and enumeration of the same. The final chapter deals with pasteurized milk and presents a large number of tables explaining in lucid form the essential facts of many investigations.

The book is rich throughout in tables which are for the most part expressed very clearly and bring out in a few lines the data which it might require pages of text to develop. An appendix, giving the methods of preparation of several kinds of culture media and tables to be used in the calculation of results closes the volume. This little book may be characterized as "meaty," and it should surely find a place in every working laboratory where the chemistry and bacteriology of milk is an important part of the work undertaken. The author is to be congratulated on having put such a large amount of information in such small space and in such readable form. Typographical errors are very rare, but two having been noted in a hasty excursion through the whole volume. It is distinctly a book which can be marked "recommended for purchase."

Samuel C. Prescott.

Training and Rewards of the Physician. *By Richard C. Cabot, M. D. J. B. Lippincott Company. Price, $1.25.*

Cabot's "Training and Rewards of the Physician" will prove a disappointment to the man who reads it to learn of the technical side of such training. He will be disappointed also if he looks for statements dealing with concrete rewards. He will find much on the philosophy, psychology and sociology of the subject, and that is what he should have expected from a book by Cabot on this subject.

The profession of preventive medicine will be especially interested in the chapters dealing with the Preparation for Public Health Work, the Influence of Important Public Health Crusades on Medical Development and Medical Practice, and the Private Practitioner's Competition with Group Medicine.

The preparation for public health work is treated in four and a half pages, two of which are devoted to sanitation in the Canal Zone. The remaining two and a half pages are given to a very lucid statement of the similarities of public health administrative work to engineering. The influence of health crusades on medical practice has been good. "A change in our beliefs upon this matter (the duty of the patient to understand his disease and to help himself) is now reacting favorably I think not only upon the development of the private practitioner towards better knowledge and control of tuberculosis." "The doctor is stimulated and jacked up by the modern anti-tuberculosis crusade. . . . Surely this is for the good of the profession as well as of the public." In speaking of supervision of private contagious disease cases by health departments he says—"This sort of checking up by experts is very salutary for all of us."

W. A. Evans, M. D.

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Disasters and the American Red Cross in Disaster Relief. *By J. Byron Deacon. Russell Sage Foundation, 1918. 230 pp. Price, 75 cents.*

"Disaster" is almost a catalogue of headlines. The *Titanic*, Cherry-Mines, the *Eastland*, the Ohio Valley Flood, San Francisco, Salem, Chelsea, Omaha, each brings its own special memory of horror; but whether the disaster is sea, flood, mine, fire or tornado, the needs of the sufferers from them are much alike and one force has shown its power to handle promptly, kindly and efficiently these tragic emergencies.

The Red Cross has not gone blindly to work to meet each problem as if it were fresh and without precedent. Rather it has used its experience in every disaster to make it more ready to handle the next one which comes, inevitably. The first chapters of the book deal with the specific measures taken in all the tragedies since San Francisco, and these chapters constitute the first report made from original documents. In the latter chapters the principles which the Red Cross has worked out are given clearly and in such form as to be valuable for reference by any person called upon to do similar work. The "Social Worker" rather than the nurse is most needed. Perhaps the most emphasized single feature is the importance of *adequate* relief administration by *local* agencies. The chart showing graphically the arrangement of all needed committees is very valuable. In the work of rehabilitation and reconstruction which will follow this great present disaster of war such a book as Mr. Deacon's will be of the utmost service.

Eunice B. Armstrong.

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A Short History of Science. *By W. T. Sedgwick and H. W. Tyler. New York: Macmillan, 1917. Pp. 15+474. Price, $2.50.*

The apparent crumbling away of foundations that have long seemed stable makes books of this sort particularly valuable just now, when the future of the world seems filled with uncertainty. It is well now and again to remind ourselves of the great and enduring progress that has been made by the human race, and especially to remember that it is progress of a kind that is inadequately characterized by the word "material." The time will come when the great calamity that has overtaken the world in our day will fall into its proper perspective and will not over-shadow all our thoughts and energies as it does at the present moment. The history of science as presented by Professors Sedgwick and Tyler is an inspiring record of the achievements of the human mind. The assurance that it gives of the enduring character of our scientific belief and of the essential humanity of the scientific spirit is welcome to all of us in these troubled times.

The authors' treatment of the history of science is broad and stimulating. The combination of expert biological with expert mathematical and physical knowledge is a particularly fortunate equipment for the production of a comprehensive history of science. The qualifications of the authors are a guarantee of the essential accuracy and wise choice of material. The body of the book is rich in matter of surpassing interest to every educated man. The style is clear and flowing. Typographical errors are practically absent. The reader will find particularly interesting Chapter VII, *The Roman World,* and Chapter XVII, *Some Advances in Natural Science in the Nineteenth Century.* Among the many excellent features of the work are a chronology and admirable list of reference books and a series of appendices containing memorable landmarks such as the Oath of Hippocrates, Harvey's dedication of his work on the circulation of the blood, and extracts from Jenner's work on vaccination. The whole book is of great value to the student of science both for consecutive reading and for reference.

Edwin O. Jordan.

A Manual of Personal Hygiene. *By George D. Bussey. Ginn & Co., 1917. 156 pp. Cloth. Price, 60 cents.*

This manual is prepared for high school students, giving brief and specific directions for the conduct of daily life, with the expectation that additional information and illustrative material will be supplied by the teacher. The facts are concisely stated in the form of definitions and directions. No attempt is made to give the physiological basis of the rules laid down or to discuss points upon which there is difference of opinion.

Much practical information for the high school student is set forth in brief chapters dealing with the following subjects; The Importance of Hygiene, Heat and Energy, Breathing, Eating, Drinking, Sleeping, Exercise, The Mind, The Teeth, The Skin, The Hair, The Clothing, Shoes, The Nose and Throat, The Chest and Lungs, The Eye, The Ear, Tobacco and Harmful Drugs, Alcohol and Patent Medicine, Bacteria, and Emergencies.

C. E. Turner, M. A.

Public Health Notes.

Abstracts by Merrill E. Champion, M. D., and M. P. Horowitz.

Plan to Save 100,000 Children.—Saving the lives of one hundred thousand children is the goal of the child welfare drive inaugurated by the Children's Bureau at Washington. The aim of the campaign is "Public Protection of Maternity and Infancy." The suggested methods by which this may be accomplished are as follows:

"*First*—The registration of births so that there may be an immediate record of every child born; and nursing and medical skill may be provided wherever family income does not permit its being secured independently.

"*Second*—For every mother prenatal care, necessary care of doctor and public nurse at confinement, and after care.

"*Third*—Children's conferences where well babies can be taken periodically to be weighed and examined, and clinics where sick children may be given medical advice.

"*Fourth*—The organization of state and city divisions or bureaus of child hygiene.

"*Fifth*—The guarding of the milk supply that every child may have his quota of clean, pure milk.

"*Sixth*—An income making possible decent living standards."

As the result of concerted efforts it is hoped that the United States, as yet unexhausted by the war, may show even greater results in saving the lives of babies than have the European countries—and they have done well.

(*M. E. C.*)

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Some Lessons from the Housing Problem in England.—F. A. Dallyn, C. E., in an article in the Canadian *Public Health Journal* for January, 1918, reviews the housing problem in England as it existed about 1851, and traces the important developments in the solution of that problem.

Conditions then existing for the working classes were indeed appalling, and although conditions are still bad in many places, there is no question that advancement has been made, particularly in those matters that affect the health of the occupants, and the sanitary condition of the home.

Nevertheless, overcrowding still exists to an abnormal degree. Thus in 1911, 22.9 per cent of the population of Dublin were living in one-room tenements, with an average of 3.18 persons per room. In Glasgow 46.9 per cent of the population were living in two-room tenements with an average of 2.43 persons per room. In Edinburgh, 29.6 per cent of the population were living in two-room tenements with an average of 2.43 persons per room. In Edinburgh, 29.6 per cent of the population were living in two-room tenements with an average of 2.16 persons per room. It is also true that over 40 per cent of the population of Glasgow, Edinburgh, Dublin and London live in tenements of three rooms or less.

The tendency today is to build garden cities, and to practice the principles of town planning. Housing, as a public health problem, would not exist today, if the sanitary laws were enforced. The housing problem has become a great social problem. It is urged, therefore, that builders and architects should not only consider the house, the street, and the town from the point of view of structure, but also from the social standpoint; and that provision be made in the universities for the instruction of young men in the principles of town planning. (*M. P. H.*)

⁂

Venereal Disease in Massachusetts.—Writing in the *Public Health Reports,* issue of February 22, 1918, Assistant Surgeon General, Allan J. McLaughlin, formerly Health Commissioner of Massachusetts, outlines a state-wide plan for the prevention of venereal diseases. He calls attention to the fact that a complex program is necessary if a successful campaign is to be waged against these diseases. Such a program will of necessity have two phases: one, a sanitary problem, to be handled directly by the health departments; and the other a moral, social and economic problem which to a great degree can best be handled by other agencies than the health departments.

Certain essentials of the program are indicated. Free diagnostic facilities such as Wassermann Laboratories should be established. Free treatment facilities should also be offered. In Massachusetts this is being accomplished through "state approved" venereal clinics situated at convenient places throughout the state. These clinics serve not only as centers for treatment but also for the distribution of free arsphenamine. Certain minimum requirements for these dispensaries are described such as equipment, personnel, records and laboratory service.

Emphasis is laid on the educational value of these dispensaries and on the need of general educational effort to impress upon the public the importance of the subject. This may be done through lectures, placards, etc. Repressive measures for the control of prostitutes are also necessary and here is needed the cooperation of the legal authorities.

Under the heading "measures which require legislation" may be grouped, according to the writer:

(1) Reporting of venereal diseases;
(2) Elimination of quacks;
(3) Counter-prescribing in drug stores;
(4) Examination and treatment of prisoners.

The method of reporting which seems most likely to succeed is based on the so-called West Australian system. Infective cases are reported by number but with the additional proviso that they are to be reported by name if the patients fail to continue treatment. (*M. E. C.*)

⁂

A Popular Book in Household Biology.—Announcement is made of the publication of the September, 1917, *Bulletin* of the North Carolina State Normal College, by Dr. E. W. Gudger. The bulletin is really a "Primer of Household Biology" and deals not only with elements of the science of life, particularly as it affects the household, but also considers some of the fundamentals of hygiene and sanitation and the maintenance of soil fertility. (*M. P. H.*)

⁂

Comparison of Draft Rejections.—The statement sometimes made that the average of health of the young men of the country is lower than it was at the time of the Civil War, as shown by the percentage of rejections in the recent selective conscription, has been disproved by the showing of Provost-Marshal-General Crowder in his report to the Secretary of War. Of the 2,510,706 men examined in the first call of the present draft, 730,756 were rejected on physical grounds, which is 29.11 per cent. In the Civil War 31.69 per cent of the men drafted were rejected. Commenting on this editorially, the *Ohio Public Health Journal* quotes General Crowder to the effect that in view of the advance in standards of medical diagnosis since the Civil War, the figures indicate a decided improvement in the physical condition of the young men of the nation. (*M. E. C.*)

⁂

Defective Development of Growing Children in War Time.—In an article appearing in *Medical Insurance and Health Conservation* for February, 1918, Dr. Henry Dwight Chapin points out the national danger of the war on growing children. Already, in all the belligerent countries, there has been a marked increase in illegitimacy, juvenile delinquency, dependency, and under-nourishment of children. In 1916, Sir George Newman estimated that at least 10 per cent of the children of England and Wales were under-nourished. It behooves us to give this matter serious attention, for under-nourishment among our own children is also prevalent. Dr. Chapin in 1905 showed that of 1,400 school children in New York that were examined, 50 per cent started the day with either no meal or one that was inadequate. The causes for the under-nourishment of the children seemed to be faulty economic practice, physiological ignorance and poverty. With the rapid increase in the price of foods since the outbreak of the war, and the comparatively slight increase in wages, under-nourishment is doubtless more prevalent today. The increase in certain common foods from 1916 to 1917 is as follows. Beef, 48 per cent; lard, 74 per cent; cheese, 50 per cent; peas, 104 per cent; potatoes, 88 per cent; beans, 55 per cent; wheat, 76 per cent; corn, 57 per cent; oats, 60 per cent; flour, 85 per cent; corn meal, 51 per cent; milk, 67 per cent. It is estimated by the New York Association for Improving the Condition of the Poor, that the cost of food representing 65,000 calories for a family of five from 1915 to 1917 is as follows:

November, 1915	$5.84
November, 1916	7.41
March, 1917	8.24
May, 1917	$8.40
November, 1917	8.97

The increase in wages from 1907 to 1916 has been 16 per cent.

It is suggested that under-nourished children should be recognized during the regular medical examinations, and that the existing relief agencies should be called on to help solve the problem. It is also recommended that education should accompany relief. (*M. P. H.*)

⁂

Serum Therapy in Epidemic Cerebrospinal Meningitis (*La Pediatria*, 1917, xxv, p. 321).—A. Longo draws the following conclusions from the epidemic in Catania in 1915: During the epidemic, which consisted mainly of mild cases, serum therapy was very efficacious, for in the municipal hospital, where it was largely adopted, the mortality was 33.7 per cent, whereas in the town, where the majority of cases were not thus treated, it was 62.2 per cent. Moreover, in 19 cases thoroughly treated there were no deaths or complications, while in 3 cases insufficiently treated (1 or 2 injections at most) and in 12 untreated only 2 complete cures resulted, 7 died, and 6 developed serious complications of the nervous system—*i. e.*, deafness and dementia, general convulsions, hydrocephalus and blindness. Among the factors which contribute to the inefficiency of serum therapy in some cases great importance is attached to the eventual existence of adhesions more or less numerous or extensive among the folds of the lepto-meninges which may frustrate the sero-therapeutic action by cutting off tracts of the meninges. The existence of such adhesions may perhaps also explain the frequence of relapses. Nephritis is no contraindication to the use of serum. The author met with severe cases of serum disease, and considers that the problem of its prevention is not yet solved.— *The British Journal of Children's Diseases.* (*M. E. C.*)

⁂

Report on the Mortality of Mothers in Childbirth.—According to *Medical Insurance and Health Conservation* for February, 1918, the Metropolitan Life Insurance Company has been able to diminish the number of deaths among its female policyholders, resulting from diseases and conditions incident to childbirth. This is due in a large measure to the extent of visiting nurse service, both for prenatal care and care after childbirth, which the Company maintains. Out of about 2,750,000 female policyholders between the ages of 15 and 44, most of whom are married, 1,769 deaths occurred in 1916 due to childbirth. The following table is of interest because of the accomplishment which it tells:

MORTALITY ASSOCIATED WITH CHILDBIRTH.

Year.	Death-rate per 100,000 Females, 15–44 Years Old.	
1911	70.1	white
	88.4	colored
1916	62.6	white
	70.4	colored

The causes of death were: puerperal septicemia, 41 per cent; albuminuria and convulsions, 29 per cent; accidents of labor, 10 per cent; accidents of pregnancy, 8 per cent; puerperal hemorrhage, 8 per cent. (*M. P. H.*)

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Welfare Work for Infants in Belgium.—Van Roy states that in no other country is the system of infant consultations so extensively applied as in Belgium. He is convinced, he says, that four-fifths of the pediatrists of Belgium have an office for giving free advice to infants. They usually have two or three rooms equipped for the purpose, apart from their regular office, a waiting room, the room in which the children are undressed and weighed and the consulting room. Each infant has its card, and a nurse helps to weigh the children. This is usually some charitable volunteer. All the hospitals have these free consultations. At Antwerp the "Associated Charities" has five in different parts of the city and prospective mothers are visited and looked after. Milk and gruels are distributed, and the infant mortality of Antwerp is exceptionally low. (*M. E. C.*)

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Welfare Work and Public Health.—In an arcle appearing in the *Journal of State Medicine* for February, 1918, B. Seebohm Rountree emphasizes the need for the conservation and protection of a nation's health endurance, energy, and physical and mental fitness. In particular the relationship of welfare work in industry and national vigor and happiness is emphasized.

It is believed that many physical wrecks and deaths in youth or in the prime of life can be saved by intelligent and adequate attention in the early stages of the history of these cases. Welfare work is defined as an organized attempt on the part of employers of labor, so far as it lies within their power, to increase the nation's assets of health, strength, fitness, staying power and the life, and to diminish all unnecessary liabilities, all leakage, and wastage, and breakage, all squandering of vitality. From another point of view it may be defined as an attempt to create an environment which enables and encourages all the workers to be and to do their best.

Welfare work must consider the following factors in industrial life: The question of constant work and a satisfactory and adequate wage; the effect of the length of the day not only on the output, but its effect on the worker; an opportunity for adequate and thorough rest; adequate attention to questions of heating, lighting, ventilation; the prevention of accidents and industrial diseases; the prevention of conditions which cause headaches, and eye strain; ample cloak room and lavatory facilities for drying wet things, and the maintenance of a high standard of cleanliness and tidiness. Provision should also be made for obtaining good food at reasonable prices, which may be eaten in comfort and under pleasant surroundings. Medical and dental care, first aid, and rest rooms should be provided. Recreation facilities should be furnished and the play, organized. Sick-clubs, savings-clubs and pension funds should be organized. An opportunity should be provided for the hearing of complaints and grievances, and these should be settled amicably. Everything should be done to maintain the satisfactory state of mind of the worker. (*M. P. H.*)

Public Health Laboratory Notes.

Abstracts by Arthur Lederer, M. D.

Labeling of Microscopical Slides in Staining Technique.—The method of making the ink may be stated briefly as follows: 15 g. of best cabinet-makers' glue are dissolved at low temperature in 100 cc. of water in a clear glass bottle. To this is added an excess of crystals of potassium dichromate and the mixture is exposed for a week or more to strong light, after which it is filtered. India ink is rubbed into this "stock solution," a slate ink cup or grinder being employed. A little of the solution is poured into the cup and a stick of India ink is applied, the rubbing being done with a circular motion. When sufficient blackness is obtained, the ink is removed with a dropper to a small bottle; the operation is repeated with a new supply of stock solution until a sufficient quantity of ink is accumulated. A supply sufficient for several years' use can be made in this way in the course of an hour or two. The ink will keep indefinitely if care is taken to prevent evaporation. It may best be kept in a small narrow-neck balsam bottle with ground joint, the joint being further sealed with a thin coating of vaseline. The label end of the slide should be clean and free from fixative, when the ink will flow freely. An ordinary clean, medium-pointed steel pen may be used. The ink will dry thoroughly in a few minutes at ordinary room temperature, after which the slides may be passed through the alcohols, stains, water and xylol without deterioration of the label.—Chas. S. Otis, *Science, 47, 219 (1918)*.

⁂

Canadian Standard Methods of Water Analysis.—The Canadian Public Health Association, according to the *Public Health Journal* for February, 1918, has adopted the 1917 Standard Methods of Water Analysis recommended by the American Public Health Association, with the following amendments:

1. That the soap method for determining hardness be made at 20° C.

2. That the Winkler method for determining dissolved oxygen should only be tentatively accepted, pending further study of the Lancaster and Bonham method, and the Miller method.

3. That the ortho-tolidine method for estimating free chlorine be eliminated.

4. That all solid media used for bacteriological purposes be clarified with 5 gms. egg albumin per liter.

4. That for bacterial counts, agar or gelatine may be used, when incubated at 20° C. for 48 hours. The 37° count on agar after 24 hours' incubation is also to be made.

5. It was not decided which medium might be considered the best presumptive test medium. It was tentatively decided that all fermentative tubes showing less than 10 per cent gas after 48 hours' incubation, should be regarded as negative, particularly if there was no apparent, active formation of gas at the time.

6. Whenever practicable, partial confirmatory tests should be made on positive presumptive tests. The media recommended are litmus lactose agar, Endo's medium, or neutral red bile salt agar. Recommendations for the final confirmatory tests are postponed pending further study of the Voges-Proskauer reaction, gas production in saccharose broth, and indol production in peptone water.

The committee were A. Bernier, A. V. De Laporte, J. G. Fitzgerald, Heber C. Jamieson, M. H. McCrody, and Joseph Race (Chairman). (*M. P. H.*)

⁂

The Use of Larger Quantities of Blood Serum in the Wassermann Reaction.—With larger quantities of serum a higher percentage of positive results is obtained. Glycerol is anticomplementary; the anticomplementary action may be overcome by increasing the quantity of amboceptor. Unconditional negative results should not be reported unless fairly large quantities of serum were used in the test.—E. H. Ruediger, *Jour. Infect. Dis. 22, 205 (1918)*.

⁂

Microscopic Method of Counting Bacteria for All Grades of Milk.—The method is based on the fact that a suspension of aluminum hydroxide readily collects the bacteria in milk and that the centrifuge is able to throw down the aluminum hydroxide containing the bacteria to one end of the centrifuge tube leaving the fat, casein, and water very largely behind. The aluminum hydroxide is readily transferred to a glass slide and dried down. As aluminum hydroxide shrinks to a very considerable degree on drying a thin microscopic film is made possible. The hydroxide has slight affinity for methylene blue and on washing with water a clear field is obtained. About 95 per cent of the bacteria in the average sample of milk appear in the hydroxide thrown down by centrifugalization.—Paul W. Allen, *Jour. Infect. Dis., 22, 245 (1918)*.

✻

Disinfection of Water With Calcium Hypochlorite.—The disinfectant action of hypochlorite is independent of the concentration of the available chlorine. It does not depend on the length of time the chlorine acts. This reaction process is not an oxidation but a chlorine resorption. The time of killing is dependent on the resistance of the bacteria. The action of calcium hypochlorite does not depend on the time of neutralization of the chlorine; it acts long after neutralization has occurred. In the presence of organic substances the active chlorine concentration is decreased. The disinfecting action of the calcium hypochlorite cannot be reckoned chemically, but must be determined experimentally for a given set of conditions. Its disinfection value is increased by fractional addition. In this case, instead of an action of concentration there is an action of dynamic accumulation.—Hans Lager, *Ztschr. f. Hyg., 81, 296; Chem. Zentralbl., 11, 354 (1916); Chem. Abstr., 12, 394 (1918)*.

✻

Blood Charcoal as a Disinfectant of Small Quantities of Water.—A report of experiments on adsorption of microörganisms from contaminated water by animal charcoal. The water is shaken with animal charcoal and filtered through paper. A clear filtrate is generally bacteria-free; charcoal passing through carries germs with it. Charcoal cannot be used for removing bacteria from milk, blood serum, or other colloids, as the colloids are adsorbed more than the bacteria. Adsorption of bacteria by charcoal is selective; cocci are adsorbed more readily than typhoid bacteria, and the latter more than B. coli.—G. Salus, *Wien. klin. Wchnschr., 29, 846 (1916); Chem. Zentralbl., 11, 674 (1916); Chem. Abstr., 12, 395 (1918)*.

✻

Serum Veal Agar: a Dependable Substitute for Ascitic or Blood Agar.—Cultures of *diplococcus pneumoniæ* grow as well on serum veal agar after the second generation as on whole blood agar, and far better than on ascitic agar. These cultures lived longer on serum veal agar at refrigerator temperatures without transplanting, than on whole blood agar or ascitic agar. After two weeks, four out of sixteen cultures on whole blood agar and ten out of sixteen on ascitic agar were dead, while all on serum veal agar were alive after seventeen days, and grew well when transplanted on the same media. Cultures of streptococci grew as well and lived as long on serum veal agar as on whole blood agar and better than on ascitic agar. Serum veal agar (veal agar, 2 per cent peptone, neutral, plus normal horse serum) can be used for maintaining cultures of most organisms ordinarily kept on ascitic or whole blood agar.—N. S. Ferry and Arlyle Noble, *Jour. Lab. and Clin. Med., 3, 295 (1918)*.

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Glycerin in Examining Feces for Typhoid Bacilli.—The use of 30 per cent glycerin in physiologic sodium chlorid solution as a medium for feces for delayed examination has been recommended by Teague and Clurman. For the past year the diagnostic laboratory of the Massachusetts State Department of Health has employed an outfit containing this solution for specimens sent through the mail. The assumption has been that better results are obtained by streaking fresh material, if it is possible to obtain it, at once, or after emulsifying it in broth, on Endo plates or some other selective medium after incubating the emulsion for an hour or two at 37 C. It was noted that specimens of feces sometimes fail to show typhoid bacilli if plated while fresh or after broth enrichment, but after from twelve to twenty-four hours in glycerin show typhoid bacilli in considerable numbers. A specimen from a typhoid carrier received recently gave negative results on plates made directly from specimens of feces and after incubation in broth, but showed many typhoid bacilli after incubation in 30 per cent glycerin for eighteen hours. Plates made from the glycerin suspension showed very few colon bacilli as compared with those from the fresh material or a broth suspension. The advantage of the glycerin would appear to be its marked inhibitory action on B. coli and its almost negative effect on B. typhosus.—Edith A. Beckler, *Jour. A. M. A., 70, 768 (1918).*

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A New and Efficient Substitute for "Nutrose."—The object of this investigation was to prepare an efficient substitute for the patent German foodstuff known as "Nutrose," used in bacteriological media. A similar substance was prepared from casein, peanut flour and Na_2CO_3. It is of great nutritive value. On account of its high protein content, and relative small amount of carbohydrates present, this preparation is particularly useful for making bread for diabetic patients. This preparation when used for making the Conradi-Drigalski medium gives a transparent medium on which organisms of the typhoid-coli group grow rapidly. This property of stimulating the growth of organisms appears to be due to the presence of a vitamine associated with the globulin contained in the peanut flour.—R. L. Mackenzie Wallis, *Agr. J. India 12, 621 (1917); Chem. Abstr., 12, 493 (1918).*

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Value of Triple Typhoid Vaccine.—In his experience with the triple vaccine Lyons has found it advisable to begin with 0.25 cc. for the first dose, advancing the dosage to 0.5 cc. for the second and 1 cc. for the third dose. In civil work this is a good plan, as many individuals are discouraged from taking their second and third doses if they happen to have some reaction with the first dose. During the past six years Lyons has inoculated over 150 persons with a mixed vaccine. Of these he has been able to follow fifty from periods of one to six years. None have developed any infections of enteric type. His own blood was examined a few weeks ago. It still agglutinated B. typhosus up to 1: 100 dilution in forty-five minutes, but no longer agglutinated paratyphoid "A" and "B". This is quite an unusual reaction after a lapse of over six years, and possibly depends on the fact that the last dose was a large one containing 1,000 millions of each organism. This brings out an interesting point that while the dosage of each organism was the same, the highest agglutination titer was always against B. typhosus. Lyons is of the opinion that if such a vaccine were generally employed in civil life, the morbidity from fevers of unknown origin and many so-called typhoids with negative bloods would be greatly lessened.—R. Lyons, *Southern Med. Jour., 11, 89 (1918); Jour. A. M. A., 70, 733 (1918).*

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Contagious Period of Whooping-Cough.—Comby cites a recent publication to the effect that the sputum from 156 Copenhagen children with whooping-cough showed the presence of the Bordet-Gengou bacillus in all who had been coughing for two weeks; in two-thirds of those who had had the paroxysmal cough for two weeks; in one-third after three weeks; only in three children out of thirty-six in the fourth week; and only once later than this. The findings confirmed the old assumption that whooping-cough is not contagious after the fifth week. Children can thus be sent back to school after four weeks of the paroxysmal cough, even although it still keeps up. Agglutination was found positive in twenty-two of the twenty-three cases tested, while it was constantly negative in 102 healthy controls. It usually appeared at the third week and was constant by the fifth week up to several months. Comby's own experience confirms that whooping-cough is contagious only in the first two or three weeks, and he reiterates that there is no use in imposing isolation after the fourth week from the first symptoms.—J. Comby, *Arch. de med. d. enfants, 20, 593 (1917); Jour. A. M. A., 70, 737 (1918).*

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Toxin Extracted from Tubercle Bacilli.—Sivori and Jauregui report that their long research has resulted in the extraction from tubercle bacilli of a toxin which responds to all the tests for peptone. It kills guinea-pigs weighing 500 gm. in six days, in a subcutaneous dose of 0.5 cc. If the animals are prepared with small doses, commencing with 0.1 cc. to a total of 1 cc. in fifteen days, they withstand subcutaneous injection of the otherwise fatal dose of 0.5 cc. without showing any disturbance. The serum of rabbits prepared in this way confers immunity also on other rabbits. Unprepared rabbits die in two hours after injection of 2 cc.; with a dose of 5 cc. rabbits die in one hour, and with 10 cc. death is practically instantaneous. The authors think that this peptone toxin from tubercle bacilli promises to be useful in serotherapy as its extreme toxicity and the immunity it confers fulfils the desiderata better than anything else known to date. No details are given as to the technic for extracting this "new peptone toxin," as they call it.—L. Sivori and F. Jauregui, *Prensa Medica Argentina, 4, 235 (1917); Jour. A. M. A., 70, 740 (1918).*

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Serologic Test of Flour.—Kostyamin obtained a prepared serum from rabbits by injecting them with different flours. He used a solution in six parts saline, filtering it through extra hard Schleicher and Berkefeld filters. The first injection was 15 cc.; the second 20 and the third 30 cc., all at five-day intervals. The animals lost nearly 100 gm. in weight but their blood serum then contained precipitins for the flour used, and it was thus possible to detect admixture of rye, barley, and oatmeal with wheat flour. The most instructive reactions were obtained when the titer of the serum was 1:300 or 1:500. As small admixtures as from 3 to 5 per cent can be thus detected when the serum is left in contact with the flour for thirty minutes. The serum seems to keep well in fused glass tubes at 4 or 6 degrees C. Flour from peas, beans and rice is also used at times to adulterate wheat flour, but he did not include them in his research.—N. N. Kostyamin, *Russkiy Vrach, 16, 518 (1917); Jour. A. M. A., 70, 741 (1918).*

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Sand Test for Typhoid Bacilli Carriers.—Borzone and Carbone report the successful use of Carbonell's modification of the sand tube for differentiation of the mire motile typhoid bacilli. The sand test was described in *The Jour. A. M. A.*, April 15, 1916, p. 1281. Carbonell's modification consists in using an outer tube, 18 cm. long by 3.5 cm. in diameter and an inner tube 14 cm. long by 2 cm. in diameter. The lower end of the inner tube tapers and curves up, and it is filled with sand to a height of 4 cm. The outer tube is partly filled with bouillon containing 1 per cent glucose and a few drops of neutral red. The sand soaks up the bouillon and the diluted specimen of feces is placed only in the inner tube. In from sixteen to eighteen hours the bouillon in the outer tube will contain typhoid bacilli in case of positive findings. In thirty suspected carriers, by this means the typhoid bacillus was detected in twenty-three and the paratyphoid B in three. Numerous tests with colon, paracolon, anthrax and dysentery bacilli and staphylococci confirmed the reliability of the differential findings.—R. A. Borzone and J. M. Carbone, *Semana Medica, Buenos Aires, 24, 569 (1917); Jour. A. M. A. 70, 895 (1918).*

Industrial Hygiene and Sanitation.

Abstracts prepared by Drs. E. R. Hayhurst, R. P. Albaugh and P. M. Holmes.

Industrial Hygiene and the Doctor and the Health Officer.—Illustrating with an interesting sketch the work done by the Division of Industrial Hygiene, Harris demonstrates the possibilities of industrial hygiene in the field of preventive medicine. More study of the causes and reporting of industrial diseases by physicians and employers, the teaching of industrial hygiene in the colleges, intensive research work, and closer medical supervision of employees are urged in a set of well-drawn conclusions.—Louis I. Harris, *New York Department of Health, Reprint No. 62,* 12 pp.

The Lighting of Industrial Establishments.—Tuck urges the inauguration of a department of maintenance of artificial lighting equipment in all work places, and gives his personally devised system of maintenance rating. This consists in applying an approximate value denoting the degree of upkeep to conditions causing loss of light, such as dirty lamps, broken or dirty reflectors, etc. An example showing how to determine the efficiency of maintenance, and the method of increasing it to one hundred per cent, is included.—Davis H. Tuck, *U. S. Pub. Hlth. Ser., Reprint 429.*

Collective Agreements on Shop Sanitation.—Agreements between employers and labor organizations, prescribing proper shop sanitation, are increasing. At the present time provisions for sanitary regulations are found in the Massachusetts agreements of bakers, compositors, furworkers, granite cutters and garment workers. Granite cutters have asked the abolition of hand surfacing machines, owing to the ill effect of their use on health. The success of the Joint Board of Sanitary Control of the Garment Trades in New York in establishing proper conditions also shows the results of coöperation between employer, employee and the public.—*Mass. Bur. of Stat.* (Chas. F. Gettemy, Director), *Bulletin No. 121,* pp. 22–24.

⁂

Feeblemindedness and Industrial Relations.—Feebleminded individuals, with the exception of the lowest type, are trainable, and can do efficient work if properly supervised and placed at a proper occupation. Such are the conclusions of Rossy who is industrial psychologist at Sing Sing Prison. The emotional instability and tendency to change positions frequently accounts for much of the great expense in the labor problem in industry. Their intellectual inferiority causes many factory accidents. A Mental Hygiene Bureau at industrial concerns where psychological tests could be made for selective purposes would greatly ameliorate the hazards and expense and tend to raise the standards of industry.—C. S. Rossy, *Mental Hygiene,* Vol. II, No. 1, Jan., 1918, pp. 34–52.

⁂

A Sanitary Cuspidor.—By the use of a sheet of paper of the proper size and texture, shaped by crinkling the edges to fit the ordinary steel cuspidor (lining it), and using a sheet of paper large enough so that a large rim is provided to bend over the edges and sides of the receptacle, a sanitary cuspidor is made. It is filled with sawdust. The janitors in cleaning the cuspidors remove the entire paper lining containing the sawdust and replace the same anew. The white collar provides a method for attracting the attention of employees to the purpose of the receptacle.—National Safety Council, 208 S. LaSalle St., Chicago. *Service Series No. 606.*

⁂

A Novel Sand Blast Room.—The American Museum of Safety, 14 W. 24th St., New York, calls attention to a model in its Museum of a sand blasting device by which the work on small articles is done in a revolving chamber provided with partitions so that while sand blasting is proceeding in one chamber, work which has just been completed in a former chamber can be removed. The worker stands outside of the whole apparatus and looks through a wire-screen. The interior of the chambers is illuminated. A rubber-line slot in the side of each chamber allows for the insertion of the nozzle of the sand blasting hose. —*Safety,* Jan., 1918, pp. 17–19.

⁂

Risk and Avoidance of T. N. T. Poisoning.—By a plausible calculation, Rice finds that between 7,000 and 17,000 cases of T. N. T. poisoning, resulting in between 135 and 475 fatalities, will probably occur in American shell loading plants during the production of the 78 million rounds of cannon ammunition so far ordered by the United States government,—unless radical improvements are made in health-conservation practices. The labor turnover, also, at such plants is so great that from 2 to 30 different persons are required for each job during one year's operations. He figures that the T. N. T. health risk might, with reasonable and inexpensive precautions, be reduced 80 to 90 per cent. At a conference of health officials and munition makers held in New York City in December at the request of a subcommittee for the Council of National Defense, munition makers voted down a clause proposed as a humanitarian protection to workers apparently for two reasons: first, that such workers should not be told the real danger as it would make them unduly apprehensive, and secondly, that workers should not be given any memoranda to be used for self protection of health or as guides to physicians in treatment, because such memoranda might be used by adventuring lawyers as bases for troublesome damage suits. The employers contended that the proper procedure should be to educate all the doctors in the diagnosis and cure of T. N. T. poisoning. The article continues with comment on the insidious character of T. N. T. poisoning with a description of the substance and the methods of its use, the four kinds of poisoning which occur, descriptions of cases of poisoning and the evident inadequacy of medical supervision of workers and the sanitation of the plants discussed. The author believes that there is the possibility of saving several hundred lives, and, in the concurrent saving of T. N. T., some $4,000,000, in completing the government's order.—Archie Rice, *Monthly Review, U. S. B. of L. S.*, Feb., 1918, pp. 13–35.

⁂

Minimum Wage Betters Industrial Welfare and Increases Profits.—The effects of minimum wage regulation of wages, hours and working conditions of women and minors in the fruit and vegetable canning industry of California for the year 1916 were a reduction in the number of children employed from 2,344 in 1914 to 1,092 in 1916 while the minimum wage did not become the maximum but wages were raised even higher than piece rates, while the output for the year was the largest in the history of the state. Hours have also been gradually reduced from year to year until about half of the canners and cutters worked less than 48 hours per week. On the matter of providing seats for women the conclusion is made that there is no good reason why compulsory standing or compulsory sitting should be insisted upon, but that a free choice of position on the part of the worker will reduce fatigue and hence increase output.—Review of *Bull. No. 1, Industrial Welfare Commission, California. Monthly Rev., U. S., B. of L. S.*, Feb., 1918, pp. 138–142.

⁂

Big Gain of Labor Output by Health and Safety Measures.—The Employment Managers' Conference at Philadelphia suggested that as much as 60 per cent in output of labor per man could be gained by a rational system of management which would give due regard to the worker's health and safety. The measures advocated had to do with shortening the working day, providing rest periods, advancing piece and time rates, cutting all overtime, re-creating in the employee an interest in the job he is doing and helping him to get the most out of his earnings and his leisure. Among practical plans for reducing labor turnover were mentioned proper selection of employees, adequate wages, steady work, promotion of physical efficiency and good habits, hearing of complaints, provision for pensions, profit sharing, etc. "Bad systems or no systems of handling employees" was put down as the greatest waste in all industries.—*Monthly Review, U. S. B. of L. S.*, Feb., 1918, pp. 173–174.

⁂

Labor Camp Conditions.—Hundreds of men live and work under sub-standard conditions, equally deplorable whether considered from the standpoint of their own welfare or their employers' profits. In addition, public health is seriously menaced. These constitute part of the conclusions in a survey of 108 camps in Ohio in the spring of 1917, where 7,772 men were employed. Construction, railroad, factory and mill camps were covered. The report ends with concise suggestions for standards in the general layout and maintenance of labor camps.—*Bull., Industrial Commission of Ohio*, Vol. IV, No. 11, Nov. 27, 1917, 22 pp.

⁂

Hookworm Infection in Mines.—A bibliography on this subject has been prepared by the Rockefeller Foundation and is given on pages 45–47 of *Bulletin 139, U. S. Bur. of Mines*, entitled Control of Hookworm Infections at the Deep Gold Mines of the Mother Lode, California.

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Pleurisy in Farm Workers.—This entire number of the *Paris Medicale* (Jan. 5, 1918, 8, No. 1) is devoted to diseases of the lungs and pleura. Braillon (p. 23) calls attention to the characteristic location of a pleural effusion in the front upper part of the pleura in men who bend over at their work, such as tillers of the soil."—*Jour. A. M. A.*, March 16, 1918, p. 817.

⁂

The Dust Hazard in Certain Industries.—The results of investigations on dusts of various types—Portland cement, flint, steel grindings, asbestos, pottery, plush, blankets and carpets, felt hats and cigars—as well as that of country and city air—are given in detail and with illustrations by Miller and Smyth of Philadelphia. The number of particles per unit volume of air, their approximate size, the influence of atmospheric humidity, of exhaust ventilation and the amount of each that actually reaches the lungs of those exposed to these various dusts are stated. A modified Palmer dust-counting apparatus was used. Outdoor country air showed 20,000 particles per cubic foot and outdoor city air about 50,000, the latter high in the smallest type of particle. As much as 15 million particles per cubic foot were counted in Portland cement which proved the maximum of all types. The great value of wet processes in handling dusty work was easily attested. It was found that as humidity increases the percentage of the larger particles of dust decreases while the minute ones correspondingly increase. Based on Lehmann's findings that about one-third of inhaled dust reaches the lungs, it was calculated that the average cement worker inhales a half gram of dust per day,—less than eleven years being required for one pound to gain entrance. Again Lehmann found that in mouth breathing 80 per cent of dust reaches the lungs, hence such workers are more quickly saturated. Dust removal at the point of production not only greatly decreases air dustiness, but particularly removes the smaller particles.—T. Grier Miller and Henry Field Smyth, *Jour. A. M. A.*, March 2, 1918, pp. 599–604.

⁂

A Self-Supporting Industrial Dental Clinic.—The Joint Board of Sanitary Control of the Ladies Garment Workers' Union in New York established a dental clinic for the members of the union on May 7, 1917. This was because the established medical clinic had disclosed the facts that at least 50 per cent of the workers suffered from bad, diseased and decayed teeth; that very few were able to get decent dentistry at moderate charges; and that workers paid large sums for defective work on their teeth, much of which only hid defects by covering them with gold crowns and bridges. In the first eight months (to December 31) 958 patients were given 3,930 treatments for their teeth. The total cost of the clinic paraphanalia was $3,545.05. Patients are charged $2.00 per hour as the basic charge and $2.50 per hour where expensive materials are used. Extractions cost 50 cents and local anasthesia $1.00. X-rays cost 75 cents for single films and 50 cents for more than one. Plate work is charged for at from $12.00 to $15.00 up. The clinic does all ordinary work. It is open from 10.00 a. m. to 9.00 p. m. daily except on Fridays and Saturdays, when it closes at 7.00 p. m. and 6.00 p. m., respectively. Summer hours are shorter. The clinic employs one full-time dentist, working fifty hours per week, at a salary of $50.00 per week, and several part-time dentists paid at the rate of $1.00 per hour. The chief difficulties so far encountered have been (a) to educate the workers in discarding bridges and crown work, (b) persuading them not to allow sound, or even slightly defective teeth, to be covered with gold crowns, (c) to educate workers to keep their appointments, and (d) difficulty in filling the time of the dentist during the day-time,—usually overcrowded in the evening.—Geo. M. Price, M. D., Director, the Joint Board, *Hospital Management*, March, 1918, pp. 32–33.

⁂

More Mysterious Deaths Prove to be Gas Poisoning.—In instances of carbon monoxide poisoning, even although all of the gas may have left the blood of the victim, so that tests for it are negative (thus the *prima facie* evidence gone), still the asphyxia produced by the experience may cause death through injury to the central nervous system. These are the conclusions of J. Bock (*Hospitalstidende*, Copenhagen, Jan. 2, 1918, 61, No. 1) who studied cases of poisoning from a defective stove in which the body of the husband was found on the floor, and two-thirds of the hemoglobin transformed to carbon monoxide hemoglobin. The body of the wife was in a closed adjoining room and only one-fifth of her hemoglobin had been thus transformed. Bock assumed that she originally had been poisoned as deeply as her husband, but that she sought the bedroom, and her blood gradually threw off most of the gas. Had she continued to breathe for a short time longer and then died, nothing would have been found at necropsy to explain her death. A baby found near the man's body showed no signs of poisoning, witnesses testifying that it was usually kept in an adjoining room, and it had probably not been brought out into the room with the stove until late. Bock experimented on animals in connection with the instance and found that the animals died even although all the carbon monoxide had been thrown off.—Abstracted from review by *Jour. A. M. A.*, March 16, 1918, p. 820.

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HISTORY OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

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AT THE meeting of the International Medical Congress held during the Centennial Exhibition in Philadelphia in 1876, Dr. Henry I. Bowditch of Boston delivered a discourse which gives a very complete history of the progress of medicine during the previous century, showing how in the period from 1776 to 1832 *Systems of Medicine* with drugs as their fetish prevailed; how from 1832 to 1869, when the first state board of health was organized, medicine developed through the work of the great clinical teachers of the modern school of medical observation and investigation, of pathological and experimental work, and especially through the recognition of the *vis medicatrix naturæ*. From 1869 to the present has been witnessed the evolution of state medicine, or what we prefer to designate as preventive medicine. To have been a teacher of science during exactly the same forty years since 1876, and, for all but six years of this period, to have been an official exponent of preventive medicine, surely entitles me to rehearse its story and illustrate some of its victories and, did time permit, to refer to some of its mistakes. During these years Bowditch tells us that national sanitary conventions had been held in Philadelphia, Baltimore, New York, and Boston in 1857, 1858, 1859, 1860. but ceased with the war. The American Public Health Association was organized, our records tell us, on April 18, 1872, at Atlantic City when Dr. Stephen Smith, Dr. E. Harris, C. F. Chandler and Doctor Bacon of New York, Dr. J. Morris, Baltimore, Dr. Henry Hartshorne of Philadelphia, Dr. Christopher Cox of Washington, Dr. John Rauch of Chicago, Dr. William Clendenin, Cincinnati, and Dr. John M. Woodworth of the Marine Hospital were present in *re nata*. It is quite true that up to 1872 many health enactments could be found on the statute books of different states especially such as dealt with quarantine epidemics and abatement of nuisances; but nothing better illustrates the difference between then and now than the polemics engaged in between Pasteur and Pidoux, Trecul and others in France and between Tyndall and Bastian in England on the germ theory as opposed to that of spontaneous generation. Doctor Bowditch in his splendid discourse points out with much elaboration in an appendix the great advances in his opinion already made in preventive medicine up to 1876, since as early as 1862 he had established to his own satisfaction the "Laws of Soil

Moisture and Land Drainage" and their "Influence in Consumption." But perhaps the most interesting part of Bowditch's paper is an analysis of the answers received to twenty questions asked in a circular sent out by him to every state and territory. The replies to Question 3 show that by 1876 there were in existence only twelve state boards of health, while the ordinary grants for public health work in all these states did not exceed $20,000. The answers to another question were that in but ten states in thirty-eight were the authorities willing to expend money to adequately support their board of health. We get perhaps the best insight as to the reason for this attitude in Bowditch's account of the progress of public health in Massachusetts. He tells us that "The Report of the Sanitary Condition of Massachusetts published by order of the Legislature in 1850, was written by a layman, Lemuel Shattuck," and further says, "I remember Mr. Shattuck well. Calm in his perfect confidence in the future of preventive medicine to check disease, he walked almost alone the streets of his native city; not only unsustained by the profession, but considered by most of them as an offense for his earnest defence of what seemed to the majority of us physicians out of the layman's sphere and withal of trifling moment compared with our usual routine of so called practice. The public, ignorant of hygiene, treated him no better; the report fell stillborn from the state printer's hands and its recommendations were ignored."

All this, as Bowditch recalls, is but an echo of what Edwin Chadwick, a lawyer, did and experienced in his public health propaganda in England; but it is interesting to recall, nevertheless, that it was in 1875 that the consolidated Public Health Act of England, largely the outcome of his efforts, was passed, containing the best results of experience in health legislation up to that time. In Canada, public health legislation was at one time perhaps more advanced than in the United States, since after the cholera epidemic of 1832 a Provincial Act for appointing Local Boards of Health was passed in 1833 and amended in 1849 so as to provide for a Central Board of Health to continue during the pleasure of the legislature. This temporary legislation was made of a permanent character when in 1882 an act establishing the Provincial Board of Ontario was passed and myself its first secretary appointed.

Such then was the general situation when in the year 1882 Koch announced the discovery of the baccillus of tuberculosis, while Pasteur by a crucial experiment demonstrated to a wondering world the immunizing power of his anthrax vaccine for sheep and cattle. The realization of what it meant to the great public health movement to have the germ theory of disease established on the permanent basis from which we today start in all our preventive propositions is seen in the rapid crystallization of the best methods hitherto tested for suppressing the various contagious diseases.

In the 11th volume (1885) of the Transactions of the Association is printed a complete alphabetical list of the titles of all papers, with their authors, read during the previous ten years, which included 335 papers and 222 authors. Both lists are most interesting and nothing has afforded me more gratification in looking through the lists of names than to recall the faces, individual traits and striking mental qualities of various persons in the list, whose broad views on public health even in that pre-scientific period were quite remarkable; though the titles of other papers occasionally indicate the reflection of medical theories belonging to the empirical age of our science. Such are illustrated by papers like that of Brewer, on "Rotting Wood" and that by Plunkett on "Cotton as a

Fomites"; or that by Abigail Miles on "The Sunstroke Epidemic of Cincinnati" during the summer of 1881. It is to be hoped that Doctor Landis has taken measures to prevent a recrudescence of the outbreak during the week of our residence in his city. Perhaps nothing, however, speaks more loudly to us of the transitory nature of the human element in the world's work, no matter how important, glorious and enduring, than that in the list of 222 names of those readers of papers I should recognize only five survivors. Need I do more than recall such names as those of Doctor Smart, Doctor Sternberg, and Doctor Billings of the Army, Doctor Gihon of the Navy, Messrs. Morris and Waring, C. E., of New York, Doctors Hamilton and Wyman of Washington or Doctor Rauch of Chicago, Doctor Lee of Philadelphia, Doctor Hewitt of Minnesota, Doctor Cochrane of Alabama, Doctor Holt of Louisiana and Doctor Wood of North Carolina to visualize for you men, most of whom had seen war on the tented field and were ever as ready and willing to defend whatever they believed to be sanitary truth and in the interests of public health as they had been before to fight for freedom, liberty and what they believed to be right? With you I would lay upon their tombs wreaths of immortelles in memory of illustrious deeds done for God, their country and humanity!

Among the earliest and most important indications of the influence of organized public health opinion may be cited the pressure of the Association upon the Congress of the United States to establish a Department of Public Health. This was expressed in a resolution adopted at the first annual meeting and referred to a committee for action. It resulted in the formation in 1879 of a national board of health which continued for the five years indicated in the terms of the Act appointing it. It is instructive to notice how, in the absence of any generally accepted scientific theory such as the germ theory of disease as a beacon light to guide all workers, the first board of health established in England in 1849 during the cholera outbreak should likewise have been appointed only for a limited period and terminated its existence at the end of seven years and that similarly such should have been the fate of the first national board of health of the United States. Fortunately, however, public health during this period in the United States was not without other witnesses and some of the functions of the national board at once passed over to the Marine Hospital Service, the oldest organized medical service in America.

The most notable event in the history of the Association following after 1873 was the amendment to the Constitution adopted at the Detroit meeting (1884) admitting Canadians to membership, thus thereby unofficially insuring coöperation with the authorities of that country engaged in public health work. This seemed especially urgent in view of the then existing cholera in cities on the Mediterranean. The year 1885 saw the greatest epidemic of smallpox of the century visit Montreal and extend to the neighboring provinces and states, which became the occasion for Dr. John Rauch of Illinois, a member of the Conference of State Boards, being invited to inspect Canadian quarantine defences as well as those of the American seaboard. The confidence in Canadian methods thereby begotten supported by a demand, based upon five months' results of organized train inspection in Ontario, by the writer at the Washington meeting in December, 1885, resulted in the removal of Canadian border quarantine inspection instituted by the Marine Hospital Service at the request of neighboring states. I find in the Transactions of the 1886 meeting in Toronto a discussion, growing out of the Report of a Committee on Interstate Notification of Infectious Diseases, in which the attitude of armed neutrality then existing is set forth by Doctor Holt, President of the State Board of Louisiana, in one of the most remarkable addresses ever made in the Association. I recommend its perusal by our younger members. Holt said:

"Yellow fever breaks out; interstate notification—and that settles the question. But in practice. . . . This question, so far from being one which can be disposed of in a few words, involves, first, the local outbreak of the pestilence; it involves all that may be said in relation to that first case or suspected case, and all that is locally involved in the disturbance of the entire social and industrial equilibrium; it involves the extension of the alarm, the commercial disturbance, and the social disturbance from your own community to neighboring communities and neighboring states; it involves the full play of human passion, and the exhibition at the same moment of the passion of terror in its most abject form of avarice in the most hideous aspect in which it can be presented in the human form, short of the cannibals of the islands of the South Sea. You have there exhibited the demoniacal nature of man, who, while it is not the fashion to lay his hands on and eat his fellow-man, yet will go just as far towards devouring him, as utterly regardless of what we call humanity as the law and the times will possibly allow him to be. And when I say that you will confront this being there, and have it confronting you, not in any timid way, but ready to take you by the throat and throttle you,—I mean that you will have there the keepers of saloons, the keepers of barrooms, the keepers of hotels and sea-shore hostelries—those men who are in your banking houses, the heads of your railroad department, men who exhibit that spirit that rather than have their personal affairs or their commercial affairs interfered with by you, or by any disturbance of which you have been apparently the head and front, they would crush you. In other words, they would not stand back a moment to prevent the pestilence from coming in right between their fingers, and ravaging the country at the expense of tens of thousands of lives, if by standing back they could only save themselves the units of dollars."

During the several immediately succeeding years no great epidemics threatened the Continent; but the discoveries appearing almost yearly, as of Koch's B. tuberculosis in 1882, of Pasteur's vaccines against rabies in 1884, and his first experiment on a human being, Joseph Meister, beginning on July 6, 1885, with a series of attenuated spinal cords and continued to July 16 when virulent material only one day old was inoculated—an act more daring and heroic than even Edward Jenner's vaccination of the boy James Phipps, in 1796; of the discovery in 1887 of B. typhosus, of Loeffler's discovery of the B. diphtheriæ in 1896 and of its antitoxin by Behring in 1897, and of the hematozoon malariæ by Laveran about the same time, were so rapidly crystallizing medical thought along lines of preventive medicine that administrative methods previously impossible of general adoption were now becoming a matter of routine practice by medical officers of health.

The next great event in the ever widening importance of the Association occurred in 1889, which witnessed the arrival of a delegation of three members of the Federal Board of Health of Mexico at the Charleston meeting, who asked admission into the Health Concert of Nations. The distinguished social qualities of these delegates and their high scientific acquirements at once commended them to the growing œcumenical Association of Science, and by resolution the Association extended its membership to these gentlemen, who the next year after came to Kansas City with a delegation from each State of Mexico and extended the cordial invitation of President Diaz and his government to hold the 1892 meeting in Mexico City. Those of us who attended there will never forget Doctor Formento in his eloquent Presidential Address when he neatly said, "This intelligent transfer of the scene of our debates, far beyond our boundaries, to the capital of our friends and neighbors, is the first step to the scientific unification of the whole American Continent. This is the first real International Health Congress on this side of the Altantic." It was at this meeting that our membership reached its highest until 1914.

But public health was growing fast. In 1891 Koch announced the discovery of a tuberculosis antitoxin and caused a veritable pilgrimage to Berlin; while Tizzani announced the discovery of the serum of B. tetanus against lockjaw, which serum is performing wonders in protecting the soldiers in the trenches today. The year 1892 also witnessed the first international sanitary commission in America, when representatives of three state boards and the Secretary of the Ontario Board of Canada were delegated to examine the Atlantic's quarantine coast defences from Halifax to Charleston in anticipation of a cholera visitation from Hamburg, whence cases on ships had already arrived in New York harbor. As Secretary of that Commission the writer recalls how local prejudices had to be met; while the publication of defects calling loudly for remedy, when given local prominence, made the position of members of the Commission at times anything but comfortable in carrying out their appointed task. The Commission's Report, however, showed how science knows no international boundaries and was the direct means of having an act passed giving the federal government jurisdiction in every part of the United States in matters of quarantine and was the occasion of the first joint Conference of Federal and Provincial Health Officers in Canada. A Report of a Committee on National Health Legislation in this same year, perhaps stimulated by the example of Mexico, reported strongly in favor of a national public health service in the United States to do the things which we now find being done so well at Washington by the Public Health Service.

An examination of subjects dealt with in the Transactions from year to year indicates no very great variation in the outlook on public health; but in the Transactions for 1894 when the second Canadian meeting of the Association was held in Montreal we find what is called "The Proceedings of the Convention." Probably none here would know what this heading means; but its chairman told how, at the meeting in Montreal, the Special Committee on Water Supply had held several meetings of bacteriologists and chemists to devise schemes for common laboratory work in examining water. Later it was decided that a special committee meeting would be required to discuss such methods and this was held in New York, June 21, 1895. Out of this meeting grew the first Section of the Association, that of Bacteriology and Chemistry. The work of standardizing laboratory methods has grown until text-books on working methods are issued by the Association and are today accepted throughout the Continent as standards. Prof. W. H. Welch spoke of that meeting as the first convention of bacteriologists on this continent; while each annual report since then has illustrated the influence, which the growing number of laboratories attached to state and municipal boards of health have had in giving exactness and definiteness to their routine work. The examination of tuberculosis sputum begun by New York Board in 1894 and the introduction in the same year of Roux's antitoxin of diphtheria as a routine treatment, resulting in the laboratory examination of swabs, marked the rapid advance in clinical treatment; while the daily examinations of water and milk supplies were giving a scientific quality of exactness to public health services which added greatly to their value and influence in both the community and state.

That, however, the Association was realizing both its duties and abilities may be seen from the range of subjects set apart for study and investigation. Thus at the Denver meeting in 1895 eighteen special committees were appointed, ranging from that on pollution of water supplies to car sanitation, to the centennial of vaccination and the international committee on prevention of spread of yellow fever. A paper presented at the Denver meeting in 1895 on "Some Degenerative Influences of Modern Civilization" by Doctor Denison is of interest as marking the tendency of public health workers to investigate sociological subjects, now become so important a part of public health work. The problem of the pollution of international streams was first discussed by Dr. P. H. Bryce in a paper on "Rivers Conservancy Boards" at the same meeting.

Probably the most notable event of the next two years is that reported in the Transactions of the year 1900 when the writer was honored with the presidency and presented a "Résumé of One Hundred Years of Public Health." This event was a paper on "A Preliminary Note on the Etiology of Yellow Fever" by Dr. Walter Reed, associated with three other medical officers, detailed by Surgeon General Sternberg to study yellow fever in Cuba. As an illustration of the application of experimental methods the simple story told of how Doctor Carroll and Doctor Lazear submitted themselves to the bite of the *Culex fasciatus*, suspected of being the carrier of yellow fever, of how Lazear, failing to be inoculated by the first mosquito, a little later allowed another to gorge itself with his blood on September 13, 1900, and of how on the 18th he sickened and on the 30th died of fatal yellow fever. The Report concludes with the simple sentence "The mosquito serves as the intermediate host for the parasite of yellow fever." The birth of the twentieth century was marked by another equally great discovery when M. Simond of the Pasteur Institute announced that his experimental work pointed to the fact of the transmission of plague through fleas living on rats infected with the disease.

In 1903 Cuba was admitted as an associate in the Public Health Association, thus rounding out the American Public Health Association as representing the whole North American Continent. In 1905 the Association held its first meeting at Havana in Cuba under the presidency of Dr. Carlos Finlay, the first to affirm the mode of transmission of yellow fever by means of mosquitoes. Doctor Finlay in his opening address paid eloquent tribute to Doctors Lazear and Reed as martyrs to science and to Cuba, and took pride in reporting that in the district of Havana during that year not a single case of yellow fever had originated. An eloquent tribute to Doctor Finlay was then paid by Dr. Benjamin Lee, a former president of the Association, who said, "The names of Reed and the heroic Carroll, of Agrimonte and Lazear the martyr; of Gorgas, Ross and Guiteras must all be blazoned high on the scroll, which shall memorize this triumphant episode in the history of state medicine; but does not the place of most conspicuous honor justly belong to him, to whom this inspiration was first vouchsafed and who so patiently and courageously maintained his thesis through long years of discouragement in the face of obliquy, derision and scorn?" It was in the next year that the first report of the committee on "The

Relations of Protozoa to Disease" was presented by C. H. Stiles, Ph. D., of the Marine Hospital Service.

The effects of such discoveries as have been noted upon the public mind were such as to make the future development of public health through governmental recognition and support comparatively easy. The nations had grown populous and rich, cities had grown enormously and their demands became proportionately insistent. With the absorption constantly of rural population and the multiplication everywhere of industries through utilizing the cheap labor of immigrants, great corporations with enormous aggregation of capital had grown up and often dominated city and state policies. The pollution of streams seemed to be accepted as inevitable with a fatalistic philosophy, which excused the yearly slaughter of many persons by means of polluted water supplies. To those in charge of public affairs it seemed splendid to stamp out yellow fever and cholera in the interests of trade with foreign ports; but why should cities busy with making money have their serenity disturbed with the problem of the lives of those citizens who were unfortunate enough to suffer from local polluted water? However, it has come about that the civic conscience in many places has begun to examine itself scientifically, and of recent years large plans, as that of Louisville, have been worked out whereby science was systematically set to work to determine through a comprehensive and sustained series of experiments on drinking waters *in situ*, the natural laws bearing upon the questions of river pollution and water purification. An epoch-making report was issued in 1904 by G. W. Fuller, C. E., in charge of the Louisville investigation. In order that the engineering members of the Association might have greater opportunities to develop this special feature of Public Health work, the Section on Sanitary Engineering was formed in 1911. A syllabus of work conprehended in the field of engineering is found in the April number, 1912, of the JOURNAL and admirably illustrates the broad views which the Section takes of the scope of its duties as they relate to Public Health.

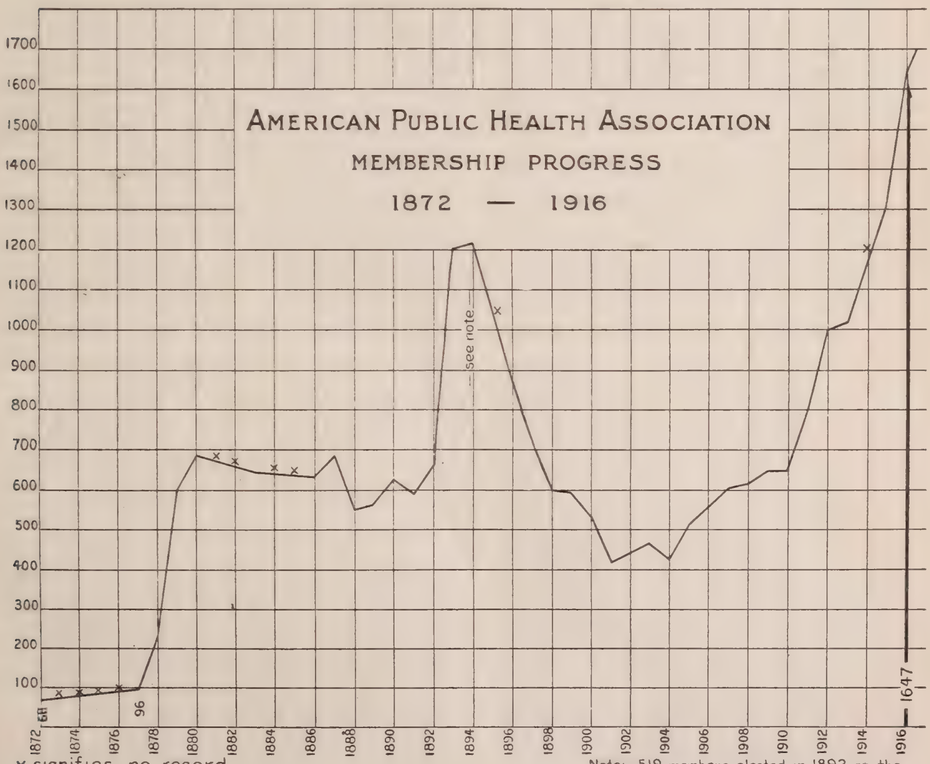
A similar direction being given to scientific thought is seen in the presidential address by Professor Westbrook of Minnesota laboratories, read at the Boston meeting in 1906. He said, "A glance at the programme for the meeting will give you some idea of the complicated mechanism and care of the health of the public and their necessity should be recognized and demanded by the public." The widening of the scientific outlook continued during the next five years and was marked in 1909 by the formation of the Statistical Section. The study of such problems as a common basis of nomenclature for diseases, the coördination of statistical methods in the different states and countries, and the utilizing for study of the statistics of school diseases, of occupations and of industries has established guides to every health official in his practical work. As in the larger cities statistical branches were being utilized for sociological investigations, it was very natural that the social workers, in increasing numbers becoming members of our Association, should have demanded the opportunity for discussion of their special problems in the Association. Hence it came about that the Section of Municipal Health Officers and the Sociological Section as well were formed at the Milwaukee meeting in 1910. As showing how sociological problems were coming into prominence a whole session at the Milwaukee meeting was devoted to the report of a "Special Committee on Prevention of Venereal Diseases" with other papers bearing upon special features of the subject. At the same meeting papers on "The American Civic Association in Relation to

Public Health," on "Child Labor and Public Health," on "The National Housing Association and Its Relation to Public Health" and "The National Association for Study and Prevention of Tuberculosis" were presented. Viewing the work of such a Section alongside that of the Statistical and Laboratory sections we may make the comparison by saying the former is to the latter very much what applied chemistry is to research work done in the laboratory of experimental chemistry.

In 1910 a series of papers were presented dealing with the important problem of education in public health and especially with the relation of universities to public health. A full discussion on the subject is reported in the Transactions of that year. How far this relationship has developed is illustrated by the work being carried out under the Sage Foundation and the Rockefeller Institute, which not only have been engaged in studying the causes of some of the most obscure diseases, but have also through special grants been producing antitoxins and serums for wide distribution, as where Toronto University has supplied such in enormous amounts for the Canadian armies in the field and widening their activities through state organizations in field experiments on hookworm, pellagra and similar endemic diseases.

After annual meetings successively in Winnipeg, Richmond, and Milwaukee the Association found itself again in Cuba in 1911. Regarding that meeting the editorial in the monthly journal next succeeding the meeting says: "To visit Cuba today where under a Cabinet Minister, the talented M. Varro Suarez, a public health organization is moving as an army moves, is to witness a triumph of state medicine unequalled elsewhere in the world. This organization from the port inspection to the last detail of sanitation in the farthest province is efficiently officered at every step from the veteran chief Dr. Juan Guiteras, down to the last appointed inspector who may keep guard over a railway construction camp." It was at the Havana meeting that an important step was taken, which has been instrumental in placing the Association in the fortunate position, which will be illustrated in the other papers forming a part of this symposium. For several years the Transactions of the Association had been appearing at first in quarterly publication and later in monthly form as the JOURNAL OF THE AMERICAN PUBLIC HEALTH ASSOCIATION, associated with the publications of the Proceedings of the Massachusetts Board of Health. A Journal Committee was appointed at Havana to arrange if possible for the establishment of a journal on a stable basis with a paid editor and permanent business headquarters. The Committee's efforts proved successful, and the present position and standing of the Association are reflected in the pages of the AMERICAN JOURNAL OF PUBLIC HEALTH, the best edited, most comprehensive and scientific journal of health in the world. The monthly editions of the JOURNAL which appeared since January, 1912, have been very much in the present tense as regards the quality of the matters appearing, and will form a natural basis for the preparation of the two papers which are to follow. A mere enumeration of the work done by the several sections, by special standing committees and in papers read by individual members at even the last meeting demands considerable space wholly apart from any reference to the quality of the matters set forth. But the blue print issued recently giving a diagram of membership from 1872 to June 1, 1916, not only shows the ebb and flow in the progress of the Association, but further illustrates as nothing else could the distance we have travelled and the height of the influence and position we have attained in the forty years of our pilgrimage. We may truly be said to have passed out from the forty years of sojourn in the wilderness and to have now been four years in the promised land of our hopes and desires. In drawing this necessarily imperfect and fragmentary history to a close I would use the words which I find written in the first number of the JOURNAL:

"To many whose lives have been spent in the work of preventive medicine it must appear that in no other field is the pilot-star so many-hued, alluring and inspiring. To make four blades of grass grow where one was, stimulates the agriculturist; but to make the solitary places of human life glad, to see not alone an individual, a community, a nation, but a whole world freed from the Damoclean sword of death ever hanging imminent in smallpox, cholera, yellow fever or plague and other infections, as tuberculosis, is to give the worker in public health a sense of potent influence over the lives of his fellow men and of close association with every one who works for human betterment and for the uplifting of mankind. If he thinks ontologically at all, he can no longer imagine human life only an accident, flotsam and jetsam, on a turbulent and never-resting sea, but rather that 'being' is an emanation from the Infinite Consciousness which makes the ego in us the occasion for the realization, by each—even in the smallest degree—that he is a constituent atom in Universal Mind, wherein is the definite idea illustrating not alone a common humanity, but also the manifestation of a universal good."



x signifies no record

Note:—519 members elected in 1892 at the annual meeting in Mexico City, of which 325 were Mexicans, who withdrew within two years.

PUBLIC HEALTH PUBLICITY AND EDUCATION THROUGH PUBLIC SCHOOLS.

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Read before the Public Health Administration Section, October 18, 1917, at Washington, D. C.

PUBLICITY and education, while identical in the minds of many, vary in an important particular. The mere presentation of facts to the public in terms presumably understood by the readers or hearers constitutes publicity. Whether education of the public results therefrom depends upon the mental attitude of those for whom and to whom the alleged educational material is presented. It is another illustration of an old adage in an altered form: You may take the water to the horse but you can't make it drink.

Publicity in public health in order to be effective must be apperceived by the public. The assimilation of the message of public health educators is a prerequisite for public education in matters pertaining to health.

The variations of nationalities in our country and the fact that a large percentage of the foreign and negro population is illiterate widens the gap in these cases between publicity and education. The publication of health messages in various languages does not guarantee their educational value in view of the fact that a reasonable proportion of those for whom translated statements are made are incapable of reading them, while the younger generation is especially trained in the reading of English. Education of the foreign born adult requires more than the visual projection of facts in wordy handbills or pamphlets. The pictorial appeal may attract attention and stimulate inquiry and be more more readily understood than much of the publicity material most generally employed.

The great promise of public health work lies in the training of the younger generation in methods of healthful living. The public and private school systems of the United States contain approximately 23,000,000, or one fifth of the population of the country. In 1914 there were 18,000,000 children in the public elementary schools. This large number of children is undergoing education in institutions organized in the interests of public welfare and carefully adjusted to the mental power of the pupils. The public school system of the United States is growing more and more to be the normal center of public education. Parents, teachers, and children constitute a normal point of entrance to almost every home in the country. The existence of the huge educational machinery should be more generally recognized as a valuable asset for those interested in public health publicity and education.

There is a large variety of methods directly available for extending the usefulness of the school systems along lines conducing to public health advancement. From the standpoint of results the educational function of health departments is relatively small compared with the potentialities of those whose daily duty and obligation it is to deal pedagogically with educational problems. What I have to suggest holds true equally for rural and urban school systems although, naturally, differences in methods will suggest themselves. Modifications will be required for adaptations to the peculiar problems of private schools.

The external parts of school buildings afford methods of publicity which merit attention. Bulletin boards for placards, announcements, and special notices to the passing public require little expenditure of time or money, especially if the bulletin boards are made by school children as part of their training in manual work. Roofs are frequently available for exhibits and demonstrations, pageants and lectures. The corridors may be made available for temporary or long term exhibits of special phases of public health as required for campaigns dealing with infant mortality, housing, tuberculosis, pure food and drug acts, etc. The auditoriums are insufficiently used during school assemblies, or at other times, for brief lectures or talks, lantern slide exhibitions, adapted moving pictures and similar other publicity agencies. The class room itself may be employed at times through the use of panels, drawings, pictures, special maps and graphs, small exhibits, etc. All these parts of the school plant may function for promoting publicity for special days, special weeks, or for promoting some specific health campaign. Thus a sunshine day, child labor day, a baby week or a health week may receive assistance as well as a campaign for the reduction of tuberculosis or for promoting safety first.

It is of paramount importance that the various public health agencies solicit and secure the coöperation of the educational authorities. All too frequently the public health publicity man loses sight of the full educational values of the publicity he desires to get over. The teaching force of the country is not fully alive to the educational content of health material. The two agencies working in harmony may secure most remarkable health educational benefits for the community. Consider the possibilities of harnessing up the energy, enthusiasm, and pedagogic power of 706,000 teachers over 522,000 of whom are serving in public elementary schools.

It is of vital importance to correlate publicity with public education—to establish the connections between the course of study as laid down by the educational authorities and the educational content of the publicity desired by the health authorities. Ordinarily publicity material is based upon the theory that the reading and hearing public will grasp its meaning. To have real educational value in a school system, however, it is absolutely necessary that the health material be presented and possibly be interpreted by the various grade teachers in terms that are understandable by the different groups of children studying in the normal graded classes of the schools.

Interest and enthusiasm may be developed by securing the actual participation of the school children in part of the problem or in all of it. Poster competitions have proven themselves exceedingly valuable and afford an opportunity of correlating the work in drawing with health propaganda. Composition writing on the various themes growing out of different phases of public health work offers unusual forms of training in English. The departments of cooking and domestic science may be utilized for the development of important thoughts connected with the sanitation and purity of foods, food conservation, and food values. Suggested problems in arithmetic involving facts of hygiene and vital statistics may provide examples involving the fundamental principles of arithmetic that are as serviceable for educational purposes as are the traditional problems drawn from the fields of commerce and industry now in general use. The ever increasing attention bestowed upon vocational and prevocational activities establishes a natural line of approach for developing the themes centering about industrial hygiene, first aid, safety devices, and sanitation.

A vast measure of benefit would ensue by the issuance of bulletins from time to time for the use of teachers in connection with school instruction, providing that a pedagogic advisor points out the ways in which such bulletins may be employed for furthering health and cultural education by relating the subject matter to physical training, civics, hygiene, physiology, domestic science, English, drawing, arithmetic, and various other types of normal school work.

Brief handbills, posters, and booklets may be found useful in the hands of children above the fifth grade if they are written in harmony with an understanding of the child mind, its mass of knowledge and psychology.

I believe that the giving of lectures to public school teachers would result in a more intelligent appreciation of their potentialities as public health educators.

There is no reason why children should not derive immeasurable advantages by understanding the purposes of medical inspection and school nursing, with some knowledge of their relation to the children's present welfare and future health, together with the interdependence of their physical power and resistance to communal health. Medical inspectors and school nurses present a medium for the education of school children, if they receive lectures by educators which will enable them to grasp the principles of education so necessary to vitalize their instruction to children. The fact that school nurses get back into the homes gives them an unusual value as educational factors in public health.

It is needless to point out the possibilities of utilizing school children for the purposes of distributing literature into the homes from which they come. To make mere messenger girls and boys of them is insufficient. They should know the content and value of the material they are carrying into the home so that they may help to interpret or emphasize its importance to the parents, who may be ignorant or indifferent. It is perfectly true that school children are in the school for the purpose of learning, but the public health side must receive its adequate share of attention. If, however, the schools are employed intelligently and with judgment there is no reason to believe that the time of the teachers and children will be wasted in a rational attempt at public health education nor will the overstressing of health topics occur.

The average school child is under school direction, supervision, and inspiration for 6.16 years. The result of wisely utilizing these 1,232 days of elementary school life is by no means problematical although the methods of use may involve many difficult problems.

Very valuable agencies for coöperation between health organizers and the school system are to be found in types of school organization which seek to present miniatures of social life. The development of junior cities, school cities, sanitary squads, and little mother leagues, represent normal developments of the modern health idea. Thoughtful consideration to the possibilities of fostering, training, and employing these types of school organizations will reveal manifold plans and methods for encouraging a civic mindedness which recognizes in health social values of the utmost importance. Childhood responds quickly to the impetus and impulse derived from contact with older persons representing authority, and is anxious to function in a way that may be helpful to their homes and the districts of the community in which their homes are located. Here is an opportunity for the direct inculcation of a spirit of healthful citizenship.

The more extensive use of school plants which recognizes that schools may and should become civic centers for the adult population provides another resource the value of which has not been fully appreciated. Lectures by duly authorized and competent persons who can present in a popular way the dictates of modern hygiene and public health are of immense value in reaching the adults who are interested or may be interested in public health affairs. It is necessary that the lecturers be capable, tactful, sympathetic and able to use the language most generally employed by the hearers. I have found, however, that a large proportion of the non-English speaking population is capable of understanding lectures phrased in simple English. Their auditory vocabulary has been developed much more successfully than their speaking vocabulary. There are some groups of adults already organized in many progressive schools which afford an existent audience that requires but little cultivation. Parents' associations, kindergarten associations, teachers' organizations consist of groups of persons vitally interested in the school system and all that pertains to the development of school children. Failure to recognize the worth of these natural groupings for educational purposes is admittedly a dereliction on the part of the public health publicity agent. All forms of publicity are of service in such organizations, but particularly valuable are those discussions which deal with the questions of contagious diseases and the cause, cure, and prevention of the numerous defects which afflict childhood.

I feel very strongly that petty jealousies of accomplishment must be set aside. The health departments and school departments are coördinate activities of communities. Their interaction and coöperation is essential to the finest development of education and health. For this reason a closer connection between the two departments is imperative.

The school system should be welcomed as an agency to point out the pedagogic weaknesses of public health publicity. The health department should be under the obligation of pointing out to the school authorities the weaknesses of school organization from the standpoint of hygiene. A tremendous amount of health education would result if health departments were advisory to school systems on all matters pertaining to the health of pupils, teachers, and employees. The importance of the teacher's health and the methods of attaining or retaining it, the advantages of annual physical examinations, the expression of opinion upon items dealing with school furniture, ventilation, lighting, books, playgrounds or special classes would serve in a most practical way to present public health opinion in a manner that would secure truly educational results.

Possibly an advisory board consisting of health officer, pedagogue, minister, business man, and labor official would make for better adapted health education in all directions.

Public health publicity must be dynamic in order to be educational. The vitalizing qualities do not lie in mere publicity. In order to secure the practical application of the facts which publicity seeks to impart there must be a conscious and well directed effort to secure its interpretation and acceptance by the great mass of people in the land. Unless the millions of children now in our public schools can receive and assimilate the ideas and concepts of public health, the work of publicity loses its most vital value for the future. It is far easier to inculcate methods of healthful living and to awaken an interest in public health problems in the plastic minds of the young than it is to correct the vicious unhygienic habits of an adult population and to convert an attitude of indifference into one of cordial coöperation and enthusiastic support. The inherent educational values of public health publicity can be and must be converted into terms understandable by children. The splendid machinery of educational institutions, urban and rural, public and private, is available for this purpose. The essential factor which is lacking appears to be the realization of the hygienic values of education and the educational content of civic hygiene and public health. When the health department and the school system both awaken to the singular opportunity they possess to advance communal welfare through systematic, organized and coöperative efforts, public health publicity will be transformed into the larger, broader, more effective and more vitalized public health education.

PUBLICITY IN HEALTH MATTERS A PUBLIC RIGHT.

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Read before the Public Health Administration Section, October 18, 1917, at Washington, D. C.

IN ALMOST every phase of human activity there is today an unrelenting conflict between the past and the present—between the things that were and the things that would be. It is the age-long contest which began with the beginning of man's social evolution. Throughout the long struggle unconsciously, sub-consciously or consciously, the goal has been individual happiness—in the phraseology of today, individual expression. To attain this—freedom to think, to speak, to act, was of prime importance. Experiments in forms of government and in codes of ethics which fill the annals of the nations are the concrete results of the underlying and universal feeling of the men of all countries and of all times. From age to age, the ideal was transformed and the purpose widened but the struggle was ever toward the same goal.

It is the great lesson of history that changes, progress, reforms, are slowly wrought. The few become possessed by a conviction. They believe a mode different from that which obtains would be a forward step. They bear witness to their faith, sometimes to their own undoing. ' A Socrates is condemned to drink the fatal hemlock. He is a victim of an inherited régime, but his death ushers in a new order.

We are accustomed to think of social progress in terms of incidents. The Magna Charta signifies the establishment of a political principle, but the demand for this instrument of government had its origin many many years before and the Charter is a formal expression of the idea that representation is the right of the governed. The French Revolution was the culmination of a long-smouldering resentment against privileges usurped by the ruling classes, and a manifestation of the desire for freedom of thought and speech. On the other hand, there are events of tremendous significance the influence of which is not realized for centuries. The discovery of gun powder brought the fall of the feudal state of society, but for a long period this result was unforeseen except by a few discerning statesmen. The invention of printing helped to apparently disrupt what had seemed the most stable institution of all time—the church.

In general, all discoveries which may be classed as scientific, whether they relate to industrial development or personal welfare, permeate slowly. Inventions which made possible the factory system of today were met with open resistance. The application of steam was characterized as "taking bread out of the mouths of the working man"—an outrage. Almost every medical discovery has had to fight its way into public favor. Distrust, toleration, acceptance, application, seems the course which all new things must run.

From the pages of history then it is evident that education is the most effective, in fact, the only means by which a mode of thought or manner of life may be changed. This is likewise the consensus of present day opinion. Every leader or worker in any field of social effort emphasizes this fact as a major premise. They differ only as to the method of procedure. Within recent years the objective, perhaps one might be allowed to say, the sensational—the spectacular—has been in vogue. It has been applied, not always with success, even to educational literature. The psychology of this method is correct. Instruction to be acceptable must not only present, it must hold attention. This is why the motion picture is so successful and why so overworked. It is this which prompts the modern editor to write up the most serious matters in the light catchy modern style. Current taste demands that subject matter be presented in predigested, easily swallowed capsules. else it is voted too stiff a dose.

It is clear that those who would educate must find the right psychological basis. In health work it is most imperative that the fundamentals be agreed upon and that all educational activities be based on these. I believe publicity as to conditions to be one of the essentials. For example, if the morbidity statistics of a community are gathered, if accurate and complete and brought before the persons interested, the information must make some definite impression. Certainly, upon all who have even in a slight degree a sense of civic responsibility. Experience proves that the publication of correct data concerning the village, town or city in which a man lives will attract and hold attention. Further, if conditions are detrimental to health and can be remedied without too much effort or expense, action will be taken. Should a large expenditure be necessary, it is likely there will be no immediate results, but the civic need registered in the community consciousness will bear fruit later.

In anything so vital it would seem those concerned would welcome publicity as to conditions which are a menace, or even a possible menace, to health. But this is not the case. In general, they resent it. Records show that sanitary conditions everywhere are below what may be called a reasonable standard, yet the majority of those whose interests are involved, perhaps, 99 per cent, consider the publication of the shortcomings an insult to the village, town or city, in which they live. The reason for this is partly historical. Since time immemorial, morbidity and mortality facts have been suppressed; in the judgment of many good citizens, legitimately. Sins against sanitation and cleanliness were like the skeleton in the closet—no well bred person ever acknowledged or referred to them. The frantic efforts in the past of many cities to conceal cases of yellow fever or cholera are matters of record. This policy was thought to be not only commercial wisdom, but the duty of every loyal citizen to the stricken city. In those days no one knew whence the infection nor how it was spread. There was, therefore, some excuse. Now, when proof is complete as to cause and means of control, concealment is nothing short of stupid. But the tradition of silence remains in the public mind. Many still feel that if outsiders do not know, the reputation of the community is safe.

This belief is strengthened by the attitude of the commercial interests. They think it folly to make public anything which may interfere with trade. An inheritance also. Time and again it has been shown the confidence which results from conviction that the truth will be given out more than overbalances the harm, but the public is still skeptical.

The masses, likewise, remain unconvinced that epidemical diseases can be controlled and eliminated. There is a lack of confidence in the health officer's direction and it is not thought a violation of good faith to conceal conditions or to ignore his orders. This is logical. Often, he has neither a force nor funds to make his authority respected, therefore, he can only make a request. In many states the courts do not yet feel any responsibility for the enforcement of sanitary law. They ignore refusals to register births and deaths and pass up appeals for assistance.

All these features of the attitude of the public toward health matters militate against a policy of publicity and are obstacles to the putting into effect of a system which in my judgment is both the legal and ethical right of the public.

There is, however, a phase which must be considered. It is the personal versus the community. To illustrate, last week we collected from every barber shop in eleven cities of the state, one or more brushes. These will be examined for crusts, blood, molds, or anything which may indicate them to be a possible or probable source of infection. Now, take the brush from the shop of a fine old gentleman who has operated a "tonsorial parlor" for many years. If it should prove to be unclean, the incident will have all the aspects of Browning's story of The Ring and the Book. There will be "one half" for him; the "other half" against; the *tertium quid* on both sides; the old gentleman, himself, who says, "he let them have 'him' (an old brush) what was never used." "Yes, it was dirty, but the shop is always clean"; the Board with the brush which means direct proof of violation of the law, and should there be a prosecution, the lawyers on both sides and the judge. How much harm will this do the owner of the shop? Will it destroy his prestige and ruin his trade? Will it on the other hand educate the public sufficiently to justify the publicity of a trial? What did it cost the Board in time and money to collect and examine the brushes? Will the experiment pay?

Convinced as he must be that publicity is the keynote to public education, the health officer is confronted daily many times with just such problems. Each is separate, each has both a personal and community aspect. While it seems arbitrary and ungenerous to subordinate the good of the individual unit to the good of the community, it is the only sane policy. As we grow increasingly into the realization of the reciprocal relations of the individual and the social unit, the obligation to both becomes clearer and the burden of responsibility heavier. Many physicians and health officers no doubt think with Portia that mercy should season justice and rule in accordance. This in general means the individual is favored at the expense of the public.

While the utmost care should be exercised to give justice and every incident analyzed and passed upon on its own merits with comparisons eliminated, the principle of action should be protection of all. And to protect, those whose welfare is involved should understand. Therefore, though it may seem harsh, every incident should be dealt with as a public matter of grave importance—again let me say with as much lenity as may be possible in the interest of the individual. During eight years of personal experience this policy has proved its effectiveness as a means of education. The activities which show least progress are those which it has been impossible to bring before the public in a way that would interest and attract.

Today, we are proud, and justly so, of our own government as an exemplar of democracy. We are willing to make the most strenuous effort and to sacrifice whatever is needful that other nations of the earth may enjoy similar blessings. As a people we are convinced that political liberty is a *right.* But it was not always so. While the principle of democracy was in the hearts of many, it was not claimed as a right without a struggle which lasted hundreds of years. The masses were educated to believe and to demand.

It must be so with health. The people must come to feel that there are health rights as well as political rights. Then they will make the demand for publicity in all matters which pertain to health as they now demand even to the smallest detail, a public record of the representatives who expend their money and make their laws.

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Questionnaire on Disabled Men. The Division of Hygiene and Engineering of the Pennsylvania Department of Labor and Industry, Harrisburg, is sending out to the employers of that state a questionnaire to ascertain the positions now held by disabled men. It will in this way aid the United States government in its plans for training soldiers disabled in war service. Employers are requested to indicate the kind of work they have found for men handicapped in any direction, including health impairments.

Dermatitis Due to Moa Wood. *The Monthly Review, U. S. B. L. S.*, December, 1917, p. 204, abstracts an article from the *Berlin Vorwärts* describing an itching eruption breaking out on the arms and other parts of the body of three workmen who were working on this Australian wood species which is sometimes used in luxurious passenger steamers. Hospital treatment of the workers required three weeks. A crysalline alkaloid was found to be the real cause of the disease.

PUBLIC HEALTH EDUCATION AND THE FAMILY MAGAZINE.

C. E. Terry, M. D., and F. Schneider, Jr.,
The Delineator—Seventh Baby Campaign, New York City.

Read before the Public Health Administration Section, October 18, 1917, at Washington, D. C.

OUR present efforts of public health education can hardly be said to have more than scratched the surface. We have all come to see in the last few years that education will be the keynote of the public health of the future, and we have come to see that public health education is a present necessity. Public support is dependent on public understanding of our aims; and public hygiene, in the sense of the public's living in obedience to the rules of hygiene, is dependent upon knowledge of what these rules are. All this is trite and obvious. How far, however, have we progressed in our propaganda?

In considering this question, you will at once think of the bulletins issued by many of our leading health departments. Many of these bulletins are admirable. The material they contain may be scientifically sound, may be clearly and convincingly written, and the distribution of emphasis may leave nothing to be desired; yet as far as public education is concerned, the effect of these bulletins may be practically negligible.

Of course, the good health department bulletin is useful as a medium for the interchange of ideas among public health workers. As an interpreter of health department aims and activities to the medical profession, it is valuable. But as a medium for reaching the man in the street and the woman in the home, it is nearly futile. Its circulation is small (that of the *Weekly Bulletin* of the New York City Department of Health, is only 6,000), and it has the double disadvantage of being free material and of dealing entirely with one kind of subject. What busy mother would stop to plow through one of our best bulletins? What father would pick one up for an evening's reading? The bulletin assuredly has its place, but must never be mistaken for the medium of general education.

Running down the list of other mediums used by health departments for educational publicity, it appears that all are more or less open to the same or similar objections. The lecture reaches a comparatively small audience and even then must be given by a gifted person in order to be successful. Exhibits may be made to reach a larger audience, but require great effort and talent in preparation, suffer from sameness of subject, and require that their audience be specially assembled. Moving pictures offer greater possibilities, but as yet the utilization of health pictures in the regular houses, which, if practicable, would be their real field of usefulness, can hardly be said to have entered the experimental stage. Newspapers with their great circulation do offer a chance to reach the public in general, but in this case the public is a very hastily reading one. Newspaper readers interested in health matters will doubtless form the habit of reading a health column, but whether many new readers will be attracted to the subject in this way is problematical.

What then can be offered as an ideal medium of public health education? What medium reaches all the people? What medium commands their interested and leisurely attention? What medium offers the variety of subject which is so desirable? In other words, what existing medium can be utilized for a saturation and resaturation of our public with the fundamental health truths which we wish to make an influential force in their subconscious minds?

Are not the great family magazines the medium we need? They have the circulation. The *Delineator*, for example, has a circulation of a million and a quarter and probably reaches three times that number of persons each month. Taking a dozen of our more widely circulated periodicals, we have a potential audience of over thirty millions. Furthermore, these magazines reach communities without organized public health work, such as could not be touched by bulletins or other health department activities. They also reach women in particular, a most valuable feature in the education of the growing generation. They are not subject to the newspapers' necessity of printing news, and reach a thoughtful, leisurely audience rather than a hasty and subway-riding one. As in the case of the moving picture house, their audience is assembled; and it is an audience which has paid for the privilege, and which by virtue of this fact places a higher value on what it obtains. In addition, the material in its columns is varied, its readers are not tired by a constant repetition of variations of the same subject. In short, is not the great family magazine the very medium by which we can reach the people in the way we wish?

Fortunately some magazine editors have seen their opportunity to use their pages for educational and welfare work. To quote a progressive editor:

"A magazine should be a storehouse of ammunition for the battles being fought from day to day. It should help the people who are doing things that are worth while. . . . Its function is to work over old plots into new stories, to rewrite biography and history in accordance with the taste of the times, to resurrect forgotten truths, to make crude information palatable, to convert abstract science into applied science, to throw a searchlight into dark spots of our civilization, to start new movements and to guide old ones, to wake up people who are asleep by sounding the burglar alarm, to twist around the heads of those who are looking backward over their shoulders; in short, to inspire, to instruct and to interest."*

Appreciation of this kind of editorial policy led the editor of the *Delineator*, Mrs. Honore Willsie, to open the pages of her magazine to a series of carefully planned articles on public health subjects and to infant hygiene in particular. Our work with the *Delineator* began modestly with a monthly column. It has since expanded to the point where one of the leading articles each month is devoted to a public health subject. In preparing these articles the aim has been to drive home the fundamental health truths in a new garb. The subject of infant mortality was chosen as being peculiarly suitable for a starting point, and as peculiarly adapted to the audience at hand. Special reliance has been placed on the fiction special; that is, the preparation of a story with the human interest aspects of regular fiction and in a regular fiction form, which is woven about some health subject. It has been the aim to make each one of these stories carry itself solely as a piece of fiction. Persons will read such stories as they would read any other story in the magazine, the public health point being made incidentally and indirectly, but, we believe, none the less forcibly.

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* *The Independent*, October, 1908.

Alternating with these stories, straight fact stories regarding conditions are inserted. Thus, in a recent issue of the magazine, there appeared a fiction-special hinging on motherhood and midwifery. In the following month's issue there appears an article telling in a strightforward way just what midwifery conditions are in this country, and just how these conditions may affect the reader and other members of her community.

Growing out of the magazine articles has come a new field service. The Seventh Baby Campaign—for such is the popular name of our effort—is no longer restricted to magazine articles. The *Delineator* has now gathered a force of trained and experienced public health nurses; and has secured two experienced laboratory men, Mr. Horatio N. Parker and Mr. Walter L. Dodd, and has equipped them with traveling laboratories for the examination of milk and water. With this field force, the magazine is offering to make careful inventories of infant mortality, and the conditions affecting it, in interested communities between 10,000 and 40,000 population. Such inventories have already been made in 11 cities, and are now being carried on continuously in seven cities at one time. All the field work is carefully supervised from the New York office, and at the end of the investigation a report is prepared by the authors of the present paper, dealing in detail with the conditions in the particular community, and outlining a program to meet the local situation. This program includes careful statements as to the cost of the measures recommended. The *Delineator* offered this service in response to a demand which had become evident after the magazine articles appeared, and offered it practically free. The only expense involved to local communities is that for the board and lodging of the nurse during her stay in the community, a matter of not over six weeks.

To advise and guide the whole campaign we have been fortunate in securing the services of a committee made up of Surgeon-General Rupert Blue, of the United States Public Health Service, Miss Ella P. Crandall, Executive Secretary of the National Association for Public Health Nursing, and Professor Selskar M. Gunn, of the American Public Health Association. In all matters of policy the magazine is prepared to abide by the decision of this committee.

We feel that a particularly valuable feature of our field work is the use made of local committees. In each city where an inventory is undertaken, committees of local workers are organized to carry out certain simple functions, such as house-to-house visitation for the enumeration of wells and privies, and for the enumeration of births. In this way, a considerable number of local people are made familiar with the problems of the local health authorities, and so acquire an understanding of their aims and endeavors. In this way, also, an intelligent backing is developed for the conscientious health official. Under this arrangement the results of the inventory are more likely to develop into action, and a permanent interest in public health is developed.

Altogether, we feel that the Seventh Baby Campaign represents an important innovation both in journalism and in public health. Through the pages of the magazine we can reach a tremendous number of persons, and reach them under extraordinarily favorable conditions. By our field work we are able to give detailed and expert assistance to communities in meeting their particular problems. We feel that these two services, working hand in hand, should greatly strengthen the prestige of our public health work, that they should greatly assist health officers, and that they should perform an important service in the way of general health education.

If this medium of public health education is as important as we believe, it is obvious that its utilization by the other great national magazines is desirable. The potential power of our family magazines, collectively working for public health in this way, is tremendous. Furthermore, there is the alluring possibility, if not certainty, that success with health propaganda would lead these magazines to turn their attention to other phases of community welfare. The possibilities are almost limitless. Utilization of these great resources depends to a large extent, we believe, upon the success of the present experiment. If the *Delineator* campaign is a success other magazines will follow its lead. If it fails, the probability is that an important medium of public health education will be lost for a long time. We feel that our experiment is made under unusually favorable circumstances. We have a free hand to do the work in the best manner, and have the assistance of great editorial talent. Whether or not this great medium shall be saved for the people depends, however, to a large extent upon the endorsement by farsighted public health officials of the editorial policy involved.

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SERVICE OF STATE PUBLIC HEALTH LABORATORIES IN TIME OF WAR.*

HENRY ALBERT,

Director, Laboratories for the State Board of Health, University of Iowa, Iowa City, Iowa.

AT THE time when our countries —I refer to Canada and the United States—entered the great war in which we are now engaged, we asked ourselves the question as to what contribution we could individually make to help bring this war to a satisfactory close as speedily as possible. As members of this laboratory section, we might likewise ask what special service can be rendered by this section or the public health laboratory workers of the countries represented by this association. I am sure that we not only share with people in general the feeling that this is a time for greater patriotism, economy, sacrifice and devotion, but as workers in a special field we keenly appreciate that this is a time for the greatest possible efficiency. One of the factors of greatest importance in the securing of greatest efficiency is the conservation of health. With this conservation, the public health laboratories play a very important part.

I have accordingly chosen as the subject of my address on this occasion, "The Service of State Public Health Laboratories in Time of War." The conclusions here arrived at will apply also, more or less, to the work of municipal and other laboratories engaged in public health work.

In order to secure as definite information as possible I sent a questionnaire to the director of every state, territorial and provincial laboratory of the countries represented by this association. Forty-four replies were received. Such include replies from the laboratories of six Canadian provinces and also from one in Porto Rico. The data of these replies have been tabulated and conclusions drawn. I shall briefly discuss them in the order that the questions were asked.

QUESTION 1. *Has your laboratory been called upon to make examinations in connection with the mobilization of troops in your state?*

This question was answered by forty-four. Of these, thirty replied—yes; and the remaining fourteen—no.

This indicates that the state public health laboratories of considerably more than one-half of the states and territories of the United States and provinces of Canada have been called upon to make examinations in connection with the mobilization of troops. In some places only a few examinations were made; in others, a large number. Thus Doctor Stone of Vermont reports that they make most of the examinations for the 8,000 troops located at one of the forts of that state. Doctor

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*Chairman's Address, Laboratory Section, Meeting of the American Public Health Association, Washington, D. C., October 17–20, 1917.

Naylor of Ontario reports that during the early months of the war they made a large number of routine bacteriological examinations for typhoid fever, diptheria, tuberculosis, etc. For some time past, however, all of this work except the making of typhoid vaccine, has been taken over by the military authorities who have well-equipped laboratories. It seems likely that with the better provision that will certainly be made for laboratory work under the immediate control of the army and the navy, there will be a decrease in the number of examinations that will be made by state public health laboratories for persons who are in active military service.

Question 1a. *If so, what kinds of examinations have been made?*

Of those that answered the question, eighteen reported the making of examinations of water; four, of milk; fourteen, Widal for typhoid; nineteen, cultures for diptheria bacilli; fourteen, sputum for tubercle bacilli; nine, cerebrospinal fluid or nasal cultures for meningococci; nine, feces for typhoid carriers; three, feces for paratyphoid carriers; seven, Wassermann tests; five, smears for gonococci; one, blood for malaria and two, feces for hookworm. Five reported the making of typhoid vaccine and two the preparation of antitoxic and bactericidal sera.

Doctor Wadsworth reports that the New York State laboratory has supplied antipneumococcus serum for the treatment of certain cases of pneumonia. They have also supplied sera for the treatment of pneumonia, meningitis and dysentery to the United States Army and Navy and the armies of our allies abroad.

Question 2. *What kinds of routine laboratory examinations do you make at the present time?*

This question was asked purely with the idea of making question No. 3 more intelligible. It is not necessary to present at this time a list of all of the different kinds of examinations made in the various state board of health laboratories. The subject was well covered in the address made by Professor Winslow as chairman of this section two years ago.

Question 3. *What additional kinds of examinations are you prepared to make in large numbers, as for instance, the examination for—*

(a) *Meningococci in suspected carriers?*

(b) *Typhoid bacilli in suspected carriers, etc.?*

In answer to this question, a number of laboratories reported that they were not at present prepared to make a large number of examinations of a kind other than is represented by the routine work as done at present. A number reported that they could be prepared to do additional work on short notice; still others reported that in order to do additional work, additional provision in the way of funds would be necessary.

Question 4. *What kinds of examinations should, in your opinion, the laboratory be prepared to make in case of the mobilization of troops in your state, in addition to those which you are now making?*

The list of examinations which laboratories should be prepared to make corresponds very closely with the list given in the answer to question 1. A number of those who responded state that the laboratories should be prepared to make every kind of examination necessary to aid in the diagnosis of communicable diseases and to determine the presence of carriers. Doctor Stovall of Wisconsin recommends that all kinds of clinical laboratory work be done for soldiers. Doctor South of Kentucky recommends that all Southern troops be examined for hookworm and malaria. Doctor Arms of Florida emphasizes the attention that should be paid to examinations for hookworm. He states that they obtained one hundred forty-eight positives out of three hundred forty examinations made at the state camp at Jacksonville. He also suggests that it would be well for the North to pay more attention to this disease since it will no doubt become more widespread as a result of the transfer of troops.

Question 5. *Are you prepared to undertake the additional work such would entail?*

This question was answered by thirty, sixteen of whom replied that they were now prepared to undertake such additional work as may be required by the mobilization of troops in their state and fourteen replied that it would require additions to the laboratory staff if such work should be attempted.

Question 6. *Is your present appropriation sufficient to enable you to carry on such additional emergency work?*

Thirty-three replies to this question were received—fourteen in the affirmative and nineteen in the negative. A number of those who responded by yes, qualified it by saying that it would be possible for them to take care of a moderate increase of work but that the funds available would not be sufficient to take care of a large increase of work. Several that answered "no" stated that in case the need should be great it might be possible to secure additional funds for that purpose. For instance, Doctor Chesley of Minnesota reported that the Public Safety Commission might grant funds if the need was very great.

Question 7. *Are you prepared to establish a branch laboratory at an encampment or cantonment that may be located in your state?*

This question was answered by thirty-one; nine replied that they are prepared to establish a branch laboratory; the remaining twenty-three replied in the negative. Doctor Spoor of Michigan reports that they are not prepared to establish a branch laboratory at present but believes that proper arrangements could be made. Doctor Champion states that a branch laboratory for milk examinations has already been established in Massachusetts. In view of the fact that the laboratory serves most efficiently the community in which it is located, it is highly desirable that all states except a few of the smaller ones, should have branch or coöperative laboratories. If, at this particular time, the main laboratory is not located in the city adjacent to a rather permanent camp, and if the city adjacent to such does not have a well-conducted municipal laboratory, it is highly desirable that a branch or coöperative laboratory of the state board of health be located at such a place. The example set by the New York State Board of Health of having a mobile laboratory which may be moved from place to place as may be required, may well be followed by other states.

I desire to call attention to the provision now being made by the Medical Advisory Committee of the Red Cross to equip four cars as laboratories and to use these car-laboratories in connection with emergency epidemiological investigations at the request of the Army, Navy and Public Health Service. Through the Public Health Service in conjunction with state boards of health they will be of special value in connection with investigative work in territory surrounding cantonments.

QUESTION 8. *Is your laboratory prepared to conduct or assist in doing field work such as:*

(a) *Water examinations, chemical and bacteriological?*

(b) *Other kinds of laboratory work?*

(c) *Sanitary surveys?*

(d) *Epidemiological investigations?*

A rather surprisingly large number of laboratories seem to be prepared to do field work. According to the replies, twenty-six are prepared to make water examinations and only three are not prepared for such; twenty-two are prepared to make other laboratory examinations in the field and only three not; twenty-three are prepared to make sanitary surveys and three not; twenty-seven are prepared to make epidemiological investigations and three not. A number failed to answer this question. In such a case it is quite likely that the answer would have been no. It seems safe to say, however, that more than one-half of our state board of health laboratories or closely related divisions of health work are prepared to do a large amount of field work. A number reported that certain phases of the field work were done by some other division of the state board of health or some other department.

As already stated, the New York State Board of Health has a mobile laboratory which may be used for field work. A year ago this mobile laboratory was sent to the Mexican border to conduct an investigation of an epidemic of paratyphoid fever.

QUESTION 9. *Will the enlistment of workers from your own laboratory interfere with—*

(a) *The routine work of your laboratory?*

(b) *The doing of additional work as may be made necessary by the mobilization of troops?*

Nine (a) was answered in the affirmative by seventeen; in the negative by eleven. Nine (b) was answered in the affirmative by eighteen; in the negative by nine. The amount of interference with laboratory work depends upon a number of factors; thus in Kentucky all of the laboratory workers are women; in Nebraska, all of the laboratory workers are above draft age, and in the province of Saskatchewan adjustments have been made so that the present laboratory workers consist of persons unfit for military service. In some places the interference has been marked, thus Doctor FitzRandolph of New Jersey reports that they have lost four men already and that more will go; Doctor Shore of North Carolina states that three of their staff have left; Doctor Cox of North Dakota reports that exemptions have been asked for the three bacteriologists in charge of district laboratories in that state and that if such are not granted, the work will be very seriously affected.

Doctor Shore of North Carolina suggests that selective draft for physicians is desirable and that if such is done, those who are needed at home for important laboratory work will be directed to remain there.

Doctor Chesley of Minnesota reports that their work would suffer seriously for awhile if all of the persons who had applied for service in the Medical Corps or were subject to draft should be called.

QUESTION 10. *Is it likely that the enlistment or drafting of physicians or other laboratory workers in the army or navy will cause any of the private, commercial, hospital or "branch" laboratories in your state to be discontinued? If so, to what extent will the work of the central state health laboratory probably be increased?*

Two report that the enlistment or drafting of physicians will cause a discontinuance of the type of laboratories mentioned whereas fifteen believe that it will not cause a discontinuance of such. In a number of places, the work of such laboratories will be markedly interfered with; thus in Iowa the persons in charge of three such laboratories have entered the Medical Corps of the Army. Although two of these laboratories will continue to do work, there is no doubt but that such will be markedly interfered with.

Whether or not such interference will appreciably increase the work of the central state laboratory is doubted by most who answered this question. A few expect a definite increase.

In response to requests as to how state public health laboratories might aid the Medical Corps of the United States Army and Navy and the United States Public Health Service, the following letters were received:

I. FROM THE SURGEON-GENERAL OF THE WAR DEPARTMENT.

1. I beg to acknowledge the receipt of your letter of August 28, 1917, in regard to your address as chairman of the Laboratory Section of the American Public Health Association. I seriously doubt if it is possible for me to suggest anything which has not already occurred to you.

2. In general the army expects to take care of the men of the new armies from the day they are sworn in at the camps and to provide a proper environment in its camps, both here and abroad. In the same general way, it seems that the state health authorities should deliver its residents to the camps free from infectious diseases, and that it should stamp out or at least control the infectious diseases in the neighborhood of the camp, and for that matter, throughout the state, in order that men traveling back and forth from their homes may not introduce these diseases into the army camps. This is, we understand, practically what you are now doing, but the collecting of large numbers of

young men on the cantonments, makes the dangers potentially greater than they have been heretofore, and calls for extra vigilance and effort.

3. We hope that special attention may be given by the state and city health departments to the diagnosis, treatment and control of syphilitic and the other venereal diseases in the civil hospitals and dispensaries. It is the custom in many civil and most army hospitals to do routine Wassermann's on all patients except, perhaps, female pay patients, and we hope that this custom may be pushed by you. New York City now inspects and closes dispensaries which do not come up to its standard in the diagnosis and treatment of syphilis. Additional beds in hospitals for venereal cases and additional dispensaries, open in the evening are needed throughout the country, and we expect that your influence will lead to remedying this deplorable condition.

4. In addition, it goes without saying, we count upon your help in emergencies for any sort of public health work. This applies particularly to the supervision of hotels, restaurants, lunch places, etc., within a short distance of the camps where many men will go in their free hours, and to all railroad stations within the state, particularly those near camps. Not only should constant supervision be exercised over the general cleanliness of the station and grounds, tracks and sidings, but adequate and suitable toilet facilities should be provided. The water supplies of all these points, of course, require frequent examination. The prevention of mosquito and fly breeding in the neighborhood is of prime importance.

5. In this work it is, of course, impossible to consider the work of the sanitary inspector and the laboratory separately; they are so closely bound together, and no attempt has been made to emphasize one at the expense of the other.

6. The state health authorities can be of great assistance to the army at this time by informing the division surgeon, of the cantonment for their district, with a copy to the Surgeon-General, U. S. A., of the epidemic diseases reported in his district, together with reports of inspections, investigations and remedial measures.

By direction of the Surgeon-General.

(Signed) F. F. Russell,

Colonel, Medical Corps.

II. From the Surgeon-General, United States Navy.

In reference to your request for comment relative to the manner in which laboratories of State Boards of Health can be of service or assistance to the navy, I would say that under normal circumstances it will probably not be necessary to call upon such laboratories for any work, but the knowledge that they exist and are prepared to render assistance if called upon would in itself make them valuable.

Under unusual or unexpected circumstances, particularly in localities in which there may be situated recruiting stations, section bases, temporary camps, or collections of men awaiting transfer, State Boards of Health laboratories might render valuable assistance in making such routine clinical investigations as sputum examinations, Wassermann tests, etc., and in case communicable diseases appeared it is conceivable that their willingness and ability to do cultural work might be of the greatest value.

Very truly yours,
(Signed) H. C. BRAISTED,
Surgeon-General, U. S. Navy.

III. FROM THE UNITED STATES PUBLIC HEALTH SERVICE.

I beg leave to acknowledge the receipt of your letter of the 28th ultimo inquiring as to ways in which laboratories of State Boards of Health might be of assistance to this service.

There is little doubt that some system of coöperation might be evolved which would be mutually helpful to the authorities concerned. State laboratories might directly or by means of properly equipped branches, aid in the control of infectious diseases in zones around military camps. The hygienic laboratory of the service might in its turn, as the practice has always been, extend its facilities to officials of state laboratories in order that these might receive training in special subjects.

Any definite plan of coöperation along the lines mentioned would of course have to be made the subject of an exchange of views in order to determine the available facilities in each state and the specific lines along which coöperation would be most profitable. After a conference to determine facilities and other means of coöperation, it would seem feasible to select certain large problems that would require laboratory work of a diverse character extending over a considerable period. The Hygienic Laboratory of the Public Health Service could be utilized as the central agency to coördinate the work, each laboratory, however, to publish its own findings and to be responsible for them. I have in mind problems such as the devising and improving of standards for water analysis, milk analysis, and sewage analysis. Other problems might include the examination and experimental use of disinfectants and other materials used in public health practice.

While the bulk of these problems would require months and years of coördinated effort, some data would undoubtedly be acquired which would be immediately useful in the present emergency. Then too, in carrying on the studies, a considerable amount of routine laboratory work might be arranged for in addition to that already undertaken by the several laboratories. By this means, the usefulness of laboratories to the public would be enhanced.

Very truly yours,
(Signed) F. H. GLENNAN,
Acting Surgeon-General.

SUMMARY AND CONCLUSIONS.

1. The public health laboratories of more than one-half of the states of the United States and provinces of Canada have made a considerable number of examinations in connection with the mobilization of troops.

2. The principal examinations which state laboratories have been making are for diphtheria, typhoid fever, typhoid and paratyphoid carriers, tuber-

culosis, meningitis and meningococcic carriers, gonorrhœa, syphilis, malaria and hookworm disease. The making of typhoid vaccine has also been an important function.

3. More than one-half of the state public health laboratories are prepared to do field work. This phase of laboratory service should be made possible in every state and province.

4. It is highly desirable that all states except the smaller ones should have branch or coöperative laboratories, in order to best serve the communities located a considerable distance from the central laboratory, and more especially, communities in the neighborhood of rather permanent military camps. A movable laboratory can take the place of such to a certain extent and in many instances may be even more serviceable.

5. The work of many state health laboratories has already been interfered with by the enlistment of some of the staff in the Medical Corps of the Army and by the calling of others through the draft.

It seems very important, and that too, from a military point of view that the efficiency of the state health laboratories should at this particular time be increased rather than diminished. Training to prepare for this kind of service requires considerable time. It seems, therefore, very desirable that through the operation of the selective draft, those who are greatly needed in public health laboratories should be left at that post of duty.

6. The state and provincial public health laboratories stand ready to aid the army and navy in every way possible. These services have, however, well-equipped laboratories and will as a rule not be in great need of aid from outside agencies for the care of those in their charge. The increase in the amount and scope of work of state public health laboratories in time of war will have to do principally with the civilian population.

It is exceedingly important that the health of all the people should be well conserved particularly at this time for the following reasons:

(a) In the prosecution of a great war like the present one, it is the duty of every person to do his best to help bring the war to a satisfactory close as speedily as possible. A person cannot do his best unless he is in good health.

(b) The forthcoming soldiers are drawn from the civilian population and should, very obviously, be in good physical condition when called to the colors.

(c) It is particularly desirable that the community in the neighborhood of rather permanent military camps and forts should be as free from communicable diseases as possible, so that the number of such cases contracted by soldiers and sailors may be reduced to a minimum. This applies not only to the diseases that are inclined to appear in extensive epidemic form, but also the venereal diseases.

(d) The transfer of troops from one country to another or from one section of a country to another will cause certain diseases to become more widespread. This will be particularly true of paratyphoid fever, typhus fever and hookworm disease.

7. The health laboratories of the countries represented by this association are cognizant of the responsibilities placed upon them by the war. Without exception, they will gladly meet that responsibility to the extent of their facilities. There are a number of laboratories that cannot render the service which adequately meets the demands of war, due to a lack of sufficient appropriation. In such places, no time should be lost to meet the deficiency. Nor need such additional appropriations be temporary—to exist only during the continuance of the war. After this war is over there will be just as great need for strong, vigorous and efficient men and women to carry on the constructive work that will need to be done, as there is at present. Increased appropriations should, therefore, be in the nature of permanent ones.

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Acute Lobar Pneumonia: Prevention and Serum Treatment. *Oswald T. Avery, H. T. Chickering, Rufus Cole, and A. R. Dochez. Monographs of the Rockefeller Institute for Medical Research. No. 7. October 16, 1917. Price $1.00.*

This monograph of the Rockefeller Institute explains in detail the present status of the problem of the prevention, treatment and cure of acute lobar pneumonia, with specific emphasis on its application to the health of the soldiers in the army cantonments.

The methods of laboratory aid in the diagnosis of pneumonia consist of isolating the pneumococcus from the lung sputum by the innoculation of white mice, or by cultivating the organism directly from the blood of the patient. In difficult cases lung puncture may be employed. By means of the agglutination and precipitin reactions that one of the four types of the pneumococcus to which the organism belongs is determined.

A therapeutic serum for infections due to Group I is administered intravenously in relatively large doses. No successful therapeutic sera for the other three groups have yet been prepared.

Healthy carriers are an important factor in the spread of this disease. Patients should be isolated and the same precautions employed to prevent their infecting other persons as are recognized as necessary in the case of epidemic meningitis.

The method of desensitization of patients subject to anaphylaxis is described in detail, as is the production of the anti-sera, and cases illustrating the method of treatment with immune sera are explained. Valuable statistics will also be found concerning the prevalence of the four types of pneumococci found in the mouths of patients and in the mouths of health individuals. At the hospital of the Rockefeller Institute 97 per cent of the cases of Type I pneumococcus infection recovered after the administration of serum in comparison to 70 per cent recovery of patients previous to the introduction of serum treatment.

The laboratory diagnosis of the type of pneumococcus infection is of great importance epidemiologically, for although no therapeutic serum is available for Types II, III, and IV, the focus of infection is determined, and thus may the dissemination of acute lobar pneumonia be restricted.

A. D. Hiller.

CONTROL OF TYPHOID FEVER IN CHICAGO.

Heman Spalding, M. D.,
and
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Department of Health, Chicago, Ill.

Read before the Public Health Administration Section, American Public Health Association, October 20, 1917 at Washington, D. C.

CHICAGO, a city of more than two and a half million inhabitants at the present time, grew from nothing to its present size in the short period of eighty years, and necessarily so rapid a growth was attended by crudities in sanitation.

The site upon which the city is built was for the most part low and flat. Some of it was under water. The main business district had to be filled in and raised approximately eleven feet to its present level.

The water supply originally was from wells and the Chicago River which flowed through the center of the growing village into Lake Michigan. Later it became necessary to tunnel under the lake and secure water from a point a considerable distance from shore. In 1867 a tunnel was run out under the lake two and one-half miles from shore through which water was drawn. With a rapidly increasing population on a low, flat margin of the lake the problem was to keep the water free from contamination.

The Chicago River draining the low lands on the west of the city received sewage as it passed through the city and then emptied its contents into the lake. The Calumet River at South Chicago drained the swamp at the southern margin of the city and discharged into Lake Michigan at 92d Street, about ten miles from the intake of the city's drinking water. All the sewers, which did not discharge into the Chicago River were made to flow into the lake so the lake received all the sewage from the city either through these sewers or the river. The Stock Yards, located at one time on the margin of the lake and later on the south branch of the Chicago River, threw its waste and filth into the lake and river.

The conditions were such that an inch rainfall always contaminated the drinking water. This was the condition in 1890 and 1891. The provisions for supplying an adequate amount of water had not kept pace with the rapidly increasing population, and at times the water could not be forced to the upper stories of the buildings. The two and one-half mile crib was the only source of water until the four mile crib was opened in 1891. A tunnel had been run out into the lake 1,500 feet to be used as an emergency supply of water in case of fire.

This loaded shotgun made it possible for some one to commit a crime and the opportunity was not neglected. The sewage laden water from this 1,500 foot tunnel was turned into the drinking water with a resulting death-rate of 174 per 100,000 population. No one was hanged or even tried for this crime. As the result of this contamination 1,997 died of typhoid fever in Chicago in 1891. This hastened the construction of more tunnels under the lake and to a greater distance from shore.

The completion and opening of the drainage canal, at a cost of $30,000,000, in 1900, reversed the flow of the Chicago River. All the sewage of the city, which formerly flowed into the lake, was turned into the Chicago River and carried down the drainage canal into the Illinois River. This, with the newly constructed tunnel put in operation in 1891, gave Chicago a pure water supply, except in the newly annexed districts with their own water supply taken from points too near shore.

But a pure water supply can be contaminated where many people dwell. Lake steamers passing the cribs or water intakes can contaminate the water with the excrements from thousands of passengers. The dredgings from the bottom of the sewage laden Chicago River dumped into the lake has at times been a source of contamination. Fifty or more men are at times employed on the crib or intake where the water enters the tunnels to keep ice from choking the inlet. These men can and do contaminate the drinking water. You cannot depend upon men to climb fifty or a hundred feet out of a well to seek the incinerator when in need of doing so. It is easier to use the well through which our drinking water flows. This man may be a "carrier" of typhoid fever bacilli. He may not start an epidemic, but he may kill a few. Men working in the well at the pumping stations on land are likewise a source of danger. Leakages into the wells from infected sources endanger the water supply. The safeguarding the water supply has long been left largely to the commissioner of public works who is not a doctor. The information as to the condition of the water supply has always been furnished to the commissioner of public works and the public from the Department of Health's laboratory. The dumping of dredgings into the lake and various sources of contamination have all been watched and their danger pointed out. For many years the Department of Health has been active in safeguarding the city's water supply, but not until quite recently has a special competent sanitarian been put in charge with authority to safeguard the water supply. No one but a competent, trained sanitarian with a conscience is fit for such a service. The average engineer cannot be relied upon to eliminate every source of contamination of the water. The 1,500 foot tunnel episode of 1890 and 1891 could not occur now. An outbreak of typhoid fever in February, 1916, the result of carelessness and ignorance on the part of employes whose business it was to keep sewage pumps going and the knowledge of the previously mentioned sources of contamination, led Dr. John Dill Robertson, commissioner of health, to take additional measures to systematically search out all sources of contamination of Chicago's water supply and apply remedies to keep it pure.

He detailed Dr. Herman N. Bundesen from the Bureau of Medical Inspection to devote his entire time to the task of keeping the water free from contamination and in eliminating so far as possible all other sources of typhoid fever. This required an inquiry into every known source of typhoid infection in the water supply, the milk supply, food supply, the summer resorts visited by Chicagoans on vacations or automobile trips.

Chicago pumps approximately 800,000,000 gallons of water daily. All of this water is treated with liquid chlorine. The chlorine is placed into the water at the suction well, is then sucked through the well by engines and distributed into the discharge mains. The dosage varies from time to time depending upon the condition of the water. During the past year the dosage has been from one-tenth part per million parts of water, to two-tenths parts per million parts of water, the average dosage being fifteen hundredths parts per million parts.

Ortho-tolidin standards are placed in each pumping station. A medical inspector from the Health Department calls at each of the pumping stations not less than twice a week to make sure the chlorination is efficient. In addition to this, the engineer on each eight-hour watch at each pumping station also tests the water for free chlorine. The apparatus used in Chicago are the machines of the Electro Bleaching Gas Company and the Wallace and Tierman Company. That chlorine in the Chicago water supply is efficient is demonstrated by the fact that of the hundreds of samples of water taken in 1911 over 18 per cent showed colon in 1 cc.

Of the samples taken the first nine months of 1917 less than one-tenth of 1 per cent of the samples showed colon in 1 cc.

Typhoid fever in Chicago is reportable and a warning card is posted on the house in every case.

A case on being reported is visited by a supervising doctor from the Health Department. He instructs the family how to disinfect the dejecta; shows them what should be done to rid the house of flies; instructs the nurse in charge how to prevent the spread of typhoid infection; establishes a back-door quarantine and obtains all information available as to the possible sources of infection. By back-door quarantine is meant a quarantine which allows the members of the family to come and go at the convenience of the household, but which places restrictions upon those who handle food. The report of the supervisor is made on a blank which calls for specific information as to typhoid vaccinations, regular and occasional water-supply, regular and occasional milk-supply, ice, oysters, vegetables, etc.

In order to facilitate diagnosis, the municipal laboratory of the Health Department makes Widal examinations free of charge. If the specimen of blood for a Widal is submitted before the tenth day of the disease and gives a negative result, another blood specimen for test is requested to be taken after the tenth day. If a case of typhoid fever is reported without a Widal test, one is requested from the family physician.

1. All members of the household are

urged to be immunized and the attendant nursing the case *must* be immunized.

2. The patient must be actually isolated, visitors excluded and dejecta adequately disinfected before disposed of.

3. The attendant on the patient must have nothing to do with the family cooking, care of children or handling of food, except for the patient and self.

4. There must be a water-closet for the exclusive use of the patient's family.

5. The family must be sufficiently intelligent and willing to carry out the rules of the Department of Health for the home care of typhoid fever. Unless these rules are adhered to, the case is hospitalized.

Typhoid fever cases are terminated only by bacteriologic examinations of feces and urine. The specimens for examination are not to be collected before the tenth day after the temperature becomes finally normal. The patient must remain isolated until the negative result has been obtained.

Where the source of the infection is out of town, the local health officer and the state health officer in the city and state from which the case emanates are notified.

As soon as the case is reported, it is spotted on a map. The system used is as follows: A map, with a scale four inches to the mile, mounted on a swinging board is divided into nine districts by a thin, water-color outline of different colors. These color districts represent the approximate water supply from one of the various sources of supply. The case is then entered in the typhoid record book and is given a number. This number is posted on the map with an ordinary cloth covered tack until all available information is received. Information on the case must be in the office within twenty-four hours from the time it was assigned to the inspector. Different colored beads and tacks are used in making up this map. For instance for the twelve months of the year there are twelve different colored beads, such as blue, pink, white, etc. Thus, if the case had its definite date of onset in January, this would be denoted by a violet bead. These beads are attached to the map by different colored tacks, a red tack denoting that the case had contracted its infection out of town, a yellow tack denoting that it was due to contact, a green tack denoting the source of infection as due to water, a black tack denoting source of the infection—undetermined, as many tacks being used as are required to denote the different sources of infection. Should the case terminate fatally, it is surrounded by a small, black ring. Therefore, a case of typhoid fever occurring in January, having contracted its infection out of town, having terminated fatally and living in the Lake View pumping station district would be indicated as follows: A red tack and a purple bead, having small number attached, encircled by a black ring is posted at the number and street where the patient is under treatment, if the case was at a residence.

A supervising medical inspector has charge of the typhoid fever under the direction of the chief of the Bureau.

He is held directly responsible for the control of the disease.

In addition to the supervising doctor's inspection, a Health Department nurse calls at each home at frequent intervals and personally sees that the excretions are properly disinfected and that the rules are adhered to.

When the case is isolated in a hospital, the hospital attendant that is nursing the typhoid cases is not permitted to attend other cases of sickness, nor are other than typhoid cases permitted to be isolated in the same quarters.

"Carrier" cases are held under quarantine until the bowel and bladder discharges are found free from typhoid bacilli.

The following is a résumé of cases of typhoid fever reported to the Department of Health in 1916:

Total number of cases reported, 1,153. Of these, 119 (11 per cent) proved not to be cases.

Total cases counted, 1,034. These were distributed by months as follows:

January	63	August	140
February	150	September	104
March	105	October	104
April	56	November	65
May	66	December	52
June	59		——
July	70		1,034

Of these 659 were males and 375 were females; 129 died (81 males and 48 females). As near as could be ascertained 306 (29.5 per cent) contracted the disease outside of Chicago; 70 (6.7 per cent) were in all probability due to direct contact with other cases; 21 (30 per cent) of these were doctors and nurses caring for typhoid cases. A localized milk epidemic was responsible for 24 (2.3 per cent) cases; 17 (1.6 per cent) were traced to food taken in a school lunch-room; 3 were traced to "carriers"; 105 (10.4 per cent) in all probability contracted the disease from the drinking water, the water at one of the pumping stations having been contaminated January 23. This pollution was discovered and warning to boil the water was sent through school children the following day; 105 cases resulted in the territory which was supplied with water by the pumping station where the sewage reached the water.

In 509 (50.7 per cent) cases the source of infection could not be traced; 238 of these cases handled food of some kind which was consumed by others: 181 housewives, 8 bakers, 7 butchers, 7 cooks, 19 nurses, 4 meat packers, 4 candy makers, 2 milkmen, 3 farmers, 1 maid, 1 grocer, 1 peddler.

The chlorination of the entire water supply was not accomplished until October 6, 1916.

The first nine months of 1917, 235 cases of typhoid fever were reported to the Department of Health, 28 of which died. For the same period last year 813 cases were reported, with 111 deaths resulting. By months the first nine months of 1917:

January	32	June	17
February	14	July	17
March	21	August	40
April	12	September	74
May	8		

PRACTICAL STANDARDS FOR FACTORY ILLUMINATION.

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Read before the American Public Health Association, Washington, D. C., October 18, 1917.

When it is remembered that the eyes are among the hardest worked of all the organs of the body and that they are extremely sensitive to external conditions, it is not surprising that eye-strain and attendant headache and functional disorders are common where lighting conditions are bad.

In a recent report* of the British Ministry of Munitions in relation to munition workers in England and France, it is pointed out that the nation's "labor power should be as zealously safeguarded as its military strength." Good lighting is one of the important factors in safeguarding and conserving the health and life of the workers.

Advantages of Good Light.—While the necessity of good light is so evident that a list of its effects may seem commonplace, these same effects are of the greatest importance in their relation to factory and mill management. The effects of good light, both natural and artificial, and of bright and cheerful interior surroundings, include the following:

1. Reduction of accidents.
2. Greater accuracy in workmanship.
3. Decreased spoilage of product.
4. Increased production for the same labor.
5. Less eye-strain.
6. Better working and living conditions.
7. Greater contentment of the workmen.
8. Better order, cleanliness and neatness in the plant.
9. Easier supervision of the men.

In this paper an attempt will be made to set forth some of the practical standards that may be serviceable in formulating legislative enactments relating to factory illumination, and also in planning or remodeling the illumination of factories by artificial light.

Present Status of Factory Lighting.—An extended investigation of factories, mills, and workshops in different parts of the United States reveals the fact that notwithstanding the great advances in recent years, a large percentage of these factories is badly illuminated; that is to say, the lighting violates the general requirements of good artificial lighting, resulting in ocular fatigue of the workmen, and great loss of labor-power. Bare lamps causing glare are still in frequent evidence. In many cases the quantity of light generated is sufficient, but only a small percentage of the light reaches the work, by reason of failure to equip the lamps with suitable reflectors. A conservative figure for the outlay for light in this country the present year is $600,000,000. It is sad to say that the avoidable waste at the present rate will reach at least 25 per cent, or the amazing total of $150,000,000.

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* Munition Workers in England and France, April, 1917.

Bearing on this situation, the following quotation from a recent report* of the British Committee on Health of Munition Workers may be of interest as showing the status of factory lighting on the other side of the water:

"The question of artificial lighting is of a special importance at the present time when night work is general, and when women and boys are employed in large numbers. . . . Notwithstanding the important bearing which good eyesight must have upon output, the question is not today receiving adequate attention at the hands of those whose duty it is to obtain this output. . . . Bad lighting affects output unfavorably, not only by making good and rapid work more difficult, but by causing headaches and other effects of eye-strain. . . . Instances have come under the notice of the Committee, of headaches and eye-strain resulting from (a) inadequate light, both artificial and natural; (b) artificial light, adequate in amount, but so placed as to throw a glare on the eyes of the workers; (c) employment of workers, whose eyesight should be aided by suitable glasses, to carry out fine work without first testing their eyesight."

General Requirements of Artificial Lighting.—The requirements for good illumination in factories, mills and other work places may be summarized as follows:

1. Sufficient illumination should be provided for each workman irrespective of his position on the working space.

2. The lamps should be properly selected and so installed as to avoid or minimize strain on the eyes of the workmen. The type and size of lamp should be adapted to the particular ceiling height and class of work in question.

3. The lamps should be operated from sources of supply which will insure continuity of service and steadiness of light.

4. Adequate illumination should be provided from overhead lamps so that sharp shadows may be prevented as much as possible, and in such measure that individual lamps close to the work may be unnecessary except in special cases.

5. In addition to the illumination provided by overhead lamps, individual lamps should be placed close to the work if they are absolutely necessary, and in such cases the lamps should be provided with suitable opaque reflectors.

These requirements may now be met by means of the new types of electric and gas lamps, one type of which can usually be found for practically each factory and mill location, specially adapted to the general physical conditions of the location and character of the work in hand.

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* Memorandum No. 9—British Ministry of Munitions on "Ventilation and Lighting of Munition Factories and Workshops," 1916. Memorandum No. 15—British Ministry of Munitions on The "Effect of Industrial Conditions upon Eyesight," 1916.

Standards of Light Intensity.—No one plan of lighting is suitable for all classes of work in factory lighting, but experience has shown that practical standards may be established for any particular class of work, or for individual operations. The whole field of industrial lighting has been roughly subdivided into eight divisions for which the minimum intensities of light required, together with the range of intensities found in ordinary acceptable practice, are given in the accompanying table which is quoted from the report of the United States Divisional Committee on Lighting of the Committee on Labor of the Council of National Defense. The data are based upon the findings of the Illuminating Engineering Society, as contained in their revised code of lighting factories, mills and other workplaces.

	*Foot-Candles** *(Lumens per Sq. Ft.) at the Work.*	
	Minimum	*Ordinary Practice.*
(a) Roadways and yard thoroughfares	0.02	0.05– 0.25
(b) Storage spaces	0.25	0.50– 1.00
(c) Stairways, passageways, aisles	0.25	0.75– 2.00
(d) Rough manufacturing such as rough machining, rough assembling, rough bench work	1.25	2.00– 4.00
(e) Rough manufacturing involving closer discrimination of detail	2.00	3.00– 6.00
(f) Fine manufacturing such as fine lathe work, pattern and tool making, light colored textiles	3.00	4.00– 8.00
(g) Special cases of fine work, such as watch making, engraving, drafting, dark colored textiles	5.00	10.00–15.00
(h) Office work such as accounting, typewriting, etc.	3.00	4.00– 8.00

Note.—Measurements of illumination are to be made at the work with a properly standardized portable photometer.

Portable Photometers.—Until quite recently it was difficult to put into practice rules for standard illumination requirements in factories, because the instruments available for testing purposes required expert knowledge of photometry to operate satisfactorily and moreover were too expensive to popularize their use. This problem has been solved by the invention of several types of inexpensive portable photometers that do not require expert knowledge to use, so that there is no reason now why every factory should not be equipped with a foot-candle meter or illumination tester. Such an instrument enables the factory manager, superintendent or inspector to determine for himself whether the proper standards of light intensity are attained in the different parts of the factory.

For all ordinary purposes in factory lighting, the type of instrument that I now show is satisfactory. You will note that this small portable foot-candle meter has no moving parts except a pointer which is set at a fixed marked position once for all when starting the light tests.

Standards of Brightness.—Intensity of illumination is only one of the factors on which good seeing depends. The intensity of light on the work may be quite sufficient to meet the prescribed standards but the illumination may nevertheless be bad because there is a glare from the lamps, or an unsuitable distribution of light on the work, or both.

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* The foot-candle, the common unit of illumination, is the lighting effect produced upon an object by a standard candle at a distance of one foot; at two feet, the effect would not be one-half foot-candle, but one-fourth foot-candle, etc. A lamp which would give off 16 candle power uniformly in all directions would produce a uniform illumination of one foot-candle at a distance of four feet in any direction.

The flux of light is measured in lumens. A lumen is the unit of light flux and is the quantity of light required to illuminate one square foot of area to an average intensity of one foot-candle.

Except in rather rare instances, exposed bare lamps should not be used. Lamps should be adequately shaded or completely hidden. Even when shaded by translucent media, such as dense glassware, the lighting units should be placed well out of the ordinary range of view, and their brightness should preferably not exceed *250 millilamberts** unless they are completely out of the field of view and do not cause troublesome reflections.

For purposes of comparison, it may be stated that the brightness of a clear blue sky in bright daylight is approximately 1,000 millilamberts. The brightness of a ten-inch opal glass ball containing a lighted 100-watt vacuum tungsten lamp at center is approxiproximately 500 millilamberts; vacuum tungsten lamp frosted, 2,000 to 3,000; vacuum tungsten lamp, filament exposed to view, 500,000; gas-filled tungsten lamp, filament exposed to view, 2,000,000; gas mantle, bare, 15,000; gas mantle concealed in six-inch opal glass globe, 1,000; mercury arc tube (glass), 8,000.

The maximum *brightness contrast* of juxtaposed surfaces in the normal visual field should be preferably not greater than 20 to 1; that is to say, the darkest part of the working space observed should have a brightness preferably not less than one-twentieth of that of the brightest part. If strictly local lighting is used, that is to say, if the well-known but antiquated system of drop lamps is used exclusively, no provision being made for adequate general illumination of the room, the figure for brightness contrast will greatly exceed the standard given above; hence it has been proposed in the state of Wisconsin* to "forbid the use of local lamps only, since with their use the field of illumination from each lamp is in sharp contrast to the surrounding darkness and causes severe eye-strain and increases accident hazard. When the local lighting is used there must be employed in addition a moderate intensity of overhead lighting uniformly distributed."

Standards of Distribution.—Lamps should be so installed in regard to height, spacing, reflectors or other accessories, as to secure a good distribution of light on the work, avoiding objectionable shadows and sharp contrasts of intensity. The illumination on the working plane should be as uniform as possible.

The *variation range* of illumination, that is to say the ratio of the maximum illumination to the minimum illumination, is a measure of the distribution of light and should preferably be less than 3 to 1 and not greater than 4 to 1, as relating to the machinery or work benches as the case may be. As relating to machinery and adjoining passageways the range may, of course, be much wider but should preferably not exceed 20 to 1.

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* A millilambert (one-thousandth of a lambert, the unit of brightness) is equal to the brightness of a perfectly reflecting and diffusing surface illuminated to an intensity of 0.929 foot-candle (0.929 lumen per square foot).

* Industrial Lighting Handbook issued by the Industrial Commission of Wisconsin, 1917.

This ratio should not be confused with the ratio of 20 to 1 previously given for brightness contrast of juxtaposed surfaces which refers to the light radiated by the object. For example, a blackboard and a white sheet of paper on it may receive the same amount of light, but the latter will reflect much more light than the former, thus causing a marked contrast between the two surfaces.

Emergency Lighting.—In industrial lighting, good practice requires that in sizable factories and mills, emergency lamps should be provided in all work space aisles, stairways, passageways, and exits to provide for reliable operation, when through accident or other cause, the regular lighting is extinguished. The best practice dictates that such lamps should be in operation concurrently with the regular lighting and independent thereof.

Switch-Control.—Switching or controlling apparatus should be so placed that at least pilot or night lamps may be turned on at the main point of entrance.

Protective Lighting.—The standards previously given for the illumination of roadways and yard thoroughfares are intended to apply in times of peace. During times of war, special precautions for protection of industrial plants should be taken. Although the practice of protective lighting for this purpose has not been standardized, there are on the market numerous lighting devices and equipment that have been found in practice to meet all the requirements. Among these are dome-shaped and angle reflectors, refractors, and flood lighting and searchlight projectors.

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Army Surgeons Wanted.—At the present time there are approximately 650 vacancies in the Medical Corps of the Army. With the view of filling these, examinations of applicants are being held throughout the country on the first Monday in each month.

Full information concerning the examination may be procured upon application to the "Surgeon General, U. S. Army, Washington, D. C." The essential requirements to securing an invitation to report for examination are that the applicant shall be a citizen of the United States, between 22 and 32 years of age, a graduate of a medical school legally authorized to confer the degree of Doctor of Medicine, of good moral character and habits, and shall have had at least one year's post-graduate hospital interneship.

Those applicants who successfully pass the examination are commissioned first lieutenants in the Medical Reserve Corps, and sent to either the Army Medical School in Washington, or to a training camp for a course of instruction, covering a period of approximately three months, during which time they draw the pay and allowances of their grade. If, at the close of their instruction, they pass the final examination, and are favorably recommended, they are commissioned first lieutenants in the Medical Corps of the Regular Army.

A first lieutenant receives $2,000 per year and is promoted at the end of five years to captain, subject to examination, and receives $2,400 a year and up. Attached to the rank of major is $3,000 a year, to which 10 per cent is added for each five years' service. The maximum monthly pay of lieutenant-colonel, colonel, and brigadier-general si $375, $416.66, and $500 respectively. Officers in addition to their pay proper are furnished with allowances of quarters according to rank.

EFFECT OF THE WAR ON THE PRODUCTION OF GARBAGE AND METHODS OF DISPOSAL.

IRWIN S. OSBORN,
Head, Waste Utilization Division U. S. Administration.

THE effect of the war on the production of garbage and methods of disposal has become very apparent during the past nine months. At the present time it has become vital from many standpoints. The education of the public to conservation of food, together with the necessity of conservation due to high cost of food products, is tending to change the problem of disposal. What the ultimate result will be is indeterminate at this time, as we are just beginning to realize that a great change is taking place, which will no doubt revolutionize this branch of sanitary engineering.

The effect of the war on the production of garbage and disposal methods are evident from following sources:

1. The decrease in the quantity produced per capita.
2. The decrease in quality or values recoverable by present day practice.
3. The tendency to change methods of disposal whereby garbage will be utilized.

The decrease in the quantity of garbage has been largely due to the increased price of foodstuffs and the conservation movement which has been started by the United States Food Administration to eliminate food wastes. Up to the present time the increased prices have, no doubt, had more effect in reducing the quantity than the conservation movement.

A reduction in the quantity of garbage is found in nearly every city, although there are few cases where the quantities have increased this year over previous years. From the studies made by the United States Food Administration, it was found that the results from approximately sixty cities, which reported on the amount of garbage collected, was an average decrease of from 12 to 15 per cent, although in some other cities an increase is shown over previous years.

The reports show, in many cases, an excessive decrease while on an examination of local conditions it is found that less attention has been given to collection, and in many cases garbage has been collected by private collectors for feeding or rendering. On account of the high values of pork, as well as the by-products that can be recovered by reduction, private collectors are more numerous than in former years. No doubt the decrease would have been considerably greater, except for the large amount of vegetable wastes going into the garbage pail from home gardens, which were the result of agitation the early part of the year.

The decrease in the quantity of garbage may not necessarily show a saving made, as regards the elimination of food wastes. The amount of grease recovered from the garbage, however, is a better indicator than the quantity of garbage collected.

While the quantity of garbage may not continue to decrease, as this factor is regulated largely by seasonal crops which vary from year to year, or the increased amount of fresh vegetables from home gardens, or an exceptional amount of home canning or preserving, there can be little doubt that the quantity of grease to be recovered from a ton of garbage will continue downward while the present conditions as to foods continue.

The meats are the chief source of grease in garbage. From the data collected during the past nine months where recoveries of grease from garbage are made, it shows a decrease of 30 per cent in the amount recovered over the same period during the year 1916, but the actual percentage of grease per ton of garbage shows a reduction of approximately 15 per cent. No doubt there has been a greater reduction in the consumption of meats, than was indicated by the decrease in the amount of grease recoverable from garbage. This is evidenced today in the purchase of meat at practically every market, where the scraps, gristle, rind, bone, in fact all wastes which were originally trimmed off and sold to rendering companies are now, in the majority of cases, pushed off on the purchaser at the price of the edible meat purchased, so that in proportion to the amount of meat that is now purchased, a greater waste is found by the purchaser than formerly. The chief evidence of this is found in the reduced amount of scraps that were formerly purchased by rendering companies, and the shortage of this material in proportion to the total amount of meats sold at the present time.

One of the noticeable features on investigation, as regards the change in garbage, is the fact that the greatest change as to quantity and quality is found in what is known as the middle class. This is, no doubt, due to the fact that the wealthier class have not changed their mode of living on account of the high cost of foods and are able to afford the same at the increased cost. The poorer section, made up principally of laborers, have been in a position to purchase food at the higher prices, on account of the high prices paid for labor, and the increased money available. The middle class, however, have not had a corresponding increase in income comparable with the increased cost of foods.

The decrease in garbage produced will no doubt continue, not only during the period of the war, but several years following, due to the habits that are formed by the people in the preparing or conserving of food, and that in the majority of cases there will of necessity be a re-adjustment of conditions insofar as disposal work is concerned. The disposal of garbage from necessity will change to meet the future conditions.

The methods for the disposal of garbage at the present time, can be classified as follows:

1. Burial.
2. Dumping.
3. Incineration.
4. Feeding.
5. Reduction.

The first two, Burial and Dumping, are carried on at a low cost, but the only result obtained is the getting rid of the material. The values are lost, and unless proper attention is given they are liable to create a nuisance.

Until recently, there has been a strong tendency towards Incineration, especially among the smaller cities. This method, in nearly every case, has been carried on at a considerable expense to the municipality, both for installation as well as operation, with no returns from any source, except in very few cases where power has been developed, but in most instances the cost of development has been greater than the revenue obtained.

There is a strong tendency at the present time towards the adoption of other methods of disposal instead of Incineration, whereby valuable returns may be made from garbage, which would be destroyed. Cities contemplating the installation of incinerators have adopted methods for utilization, and in some cases where incineration plants have been in service for a number of years there is a movement to abandon this practice, and adopt methods whereby garbage will be utilized.

Realizing the shortage of materials, such as garbage contains, the method of destruction from the standpoint of conservation is wrong, although from a sanitary standpoint this method of disposal can be considered one of the most desirable.

Disposal by Feeding, or the adoption of piggeries for the disposal of garbage, is a method that will be found desirable in a great number of cities, although in the larger cities no doubt other methods more suitable can be adopted. It is being demonstrated that, where proper care is given to this method of disposal, very satisfactory results are obtained, and no doubt with more attention given to this method greater advance will be made.

To the average mind, the feeding of garbage to hogs is very objectionable, but when ordinary precautions are taken with regard to cleanliness, the feeding can be done in a wholly unobjectionable manner, and when conducted properly in a business-like manner, there can be little objection to this method of disposal.

When we realize that from each 1,000 population there is produced waste from the preparation of food sufficient to maintain twenty-five hogs and develop them to a point ready for the market, it is evident that by this method of disposal one of the greatest economies can be obtained when properly conducted.

With the present price of pork, garbage when disposed of by feeding will produce from $7 to $8 in value for each ton.

It is evident from the values that can be obtained from this source, that, in the smaller cities and communities where garbage can be properly collected and controlled, no other method of disposal will show the same returns from an economical standpoint as the feeding to pigs, and no doubt there will be a great tendency towards the adoption of this method under the present prevailing conditions, as well as the future conditions which are expected.

The method of disposal whereby

garbage is reduced and the valuable by-products are recovered in the form of grease and fertilizer tankage no doubt will continue to dispose of the garbage produced from the larger cities and prove to be the most advantageous method that can be adopted, under proper conditions. The decrease in the quantity of garbage, as well as the values that can be recovered, will influence to a large extent this method of disposal. There will, no doubt, however, be sufficient wastes in the larger communities having sufficient values to warrant the adoption of this method.

The decrease in quantities of by-products to be recovered will to a large extent be offset by the increased values of the by-products, and at the same time there will be a tendency to recover additional by-products not now attempted. There are developments under way at the present time, and equipment being installed, whereby additional recoveries beside tankage and grease will be made.

From present indications, garbage will be more valuable for the recovery of by-products than when the grease and tankage were obtained in larger quantities. There is an ever increasing demand for the tankage produced from garbage for use in the manufacture of fertilizer. A large amount of animal tankage formerly used for fertilizer has been deflected into other sources, so that at the present time there is a great shortage of this material.

There has been objection to garbage tankage as a fertilizer. The price of nitrogenous fertilizer is determined by the available nitrogen. By the old methods of determining the available nitrogen of garbage tankage, it was found to be low, but from the actual soil tests made by the United States Department of Agriculture, Bureau of Soils, it was found that the material decomposed readily, and afforded a rapid available nitrogen supply. The necessity for the use of all available nitrogenous fertilizer material will make a greater demand, and no doubt garbage tankage will be considered equal to other materials for the manufacture of fertilizer.

The values of the by-products produced by the existing reduction plants at present prices will amount to $8,500,000 for grease and $2,250,000 for fertilizer tankage.

From the garbage tankage as produced from all the reduction plants at the present time, there can be produced annually about 9,000,000 pounds of nitrogen, 25,000,000 pounds bone phosphate lime, and 2,500,000 pounds of potash. The grease that is produced is split up into various by-products, the glycerine content being the most valuable. From the garbage grease produced in the plants operating in the United States, 8,000,000 pounds of nitro-glycerine can be produced from the recovered glycerine, after which from the grease used for the manufacture of soaps there can be produced approximately 200,000,000 twelve-ounce cakes of soap.

The amount of garbage that is produced per capita per day is small, but, when we realize all the wastes that are produced in this form from the total population, the amount is tremendous.

There are two sides to the problem of utilization—its cost to the community and the revenues that can be obtained from utilization, and when we consider the problem of conservation, even if there were no revenues, it is desirable to utilize all valuable elements which otherwise would be wasted.

There is a great shortage of the materials that can be produced from garbage. It is not a question of profit; every community should utilize its wastes, and make available from this source everything possible for the country's needs.

The food problem will not end with the war. The shortage of fats and fertilizer will remain a problem for years to come, and the installation of proper methods for the utilization of garbage will not only contribute to help under present conditions, but will remain a permanent benefit for future years. The public will not soon forget the present lessons being taught in economy. The effects of this will remain long after the necessity has disappeared, and, no doubt, the public will never again waste so much, through the medium of the garbage can, as has been done in the past.

PRACTICAL ASPECTS OF DEHYDRATED FOODS.

Lucius P. Brown,
Director, Bureau of Foods and Drugs, Department of Health, New York City.

When the United States entered the great war and it became apparent that we should have to take the same care of our available supplies of food as was being done by the warring nations of Europe, one of the first methods of conservation proposed was the addition to the fully developed canning, pickling and the like, of the oldest of them, to wit, drying. Those of us who are country-raised and particularly those of the South and West will remember the drying stands for peaches and apples and the yellow strips of pumpkin, which, in the remoter parts of the country, were an almost invariable feature of the landscape in the late summer and early autumn months. The products thus obtained were excellent in their nutrient qualities and palatability but often left something to be desired from the standpoint of appearance. The great prevalence of canning and the quality of its products together with the propaganda work instituted by the canners, without doubt had a good deal to do with the failure to develop the dehydrating industry in the United States; possibly, however, of greater importance, as explaining the much larger relative development of this industry in Germany, is the fact that the United States is, as compared with that country, a comparatively small producer of potatoes. Germany produces per capita almost twenty times as much. The conservation problem, therefore, on this product is much more acute and has been met in Germany largely by dehydration, and the development of the process with potatoes has had its effect on other vegetables.

Dehydration is perfectly practical for much the larger portion of our list of vegetables and, as practiced, consists merely in reducing the sound fruits or vegetables to suitable sized pieces and the subjecting of this material to heat; a certain humidity in the drying atmosphere is of very great value in producing a satisfactory product.

The advantages to be derived from the development of dehydration in the United States are as follows:

1. The enabling of the purchase by the poor in cities of vegetables the year round.

2. A better balancing of the American dietary, which is deficient in vegetable elements as compared with that of European nations.

3. The utilization of surplus now remaining in growing districts caused by the seasonal overlapping of production in different latitudes or by too rapid ripening, shortage of labor, unfavorable weather conditions, etc.

4. Lessening of the demands on railroads for tonnage and car space, both because of the elimination of the water in the products and of the expensive and heavy crates, barrels, etc. now used.

5. Proceeding from all of the above, an increase in production and consumption of vegetables and a decrease in consumption of the staples,—grains and meats.

6. Somewhat subordinate, a relief of the housewife from the trouble of preparing the fresh vegetables because the dehydrated product is ready at once to be cooked.

There is at this time no civilian market ready to take such material. Because of the great interest in the subject the matter has been brought strongly to the attention of the War and Navy Departments and it appears at this time probable that both of these are inclined to follow the European example and make such products an integral part of the army ration. Both for such purposes and for civilian use it is necessary that materials of the highest possible quality be produced. With the efforts that are being made all over the United States to develop the industry, it is certain that many mistakes will be made in production, with the result of a great deal of inferior material coming on the market. The necessity for standardization of quality therefore is apparent, and and it appears probable that only with such standardization of quality can a market in civil life be created. It seems, therefore, reasonable to suggest that the federal government should at once address itself, through the Food Administration and the Agricultural Department, to the matter of establishing grades and that only materials of a specified grade should be allowed to be sold. Just what machinery will be necessary for this cannot be suggested at this time. A system of licenses predicated on proper equipment to begin with and on the continued production of standard material suggests itself. Another system would be one analagous to the system of meat inspection now conducted by the Bureau of Animal Industry.

On the business side of the matter, it would appear that the quickest method of obtaining an aggregate production of considerable size would be the establishment in producing centers of comparatively small units. Except in the growing of potatoes a sufficient production within a reasonable radius to maintain a large unit would have to be developed. Small units would be of comparatively low cost but such supervision as has been suggested would be absolutely necessary in order that uniformity of product could be procured. It is obvious, too, that small units could be profitably attached to canneries, small flour mills or any other manufacturing establishments already provided with buildings and power.

MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH

THE annual meeting of the Massachusetts Association of Boards of Health was held at the Hotel Victoria, Boston, Thursday, January 31, 1918.

It was voted to dispense with reading the record of the preceding meeting.

On recommendation of the Executive Committee the following applicants were admitted to membership in the Association: Mr. A. W. Hedrick, 126 Massachusetts Ave., Boston; Dr. Franklin C. Downing, Stockbridge; Dr. Ralph E. Foss, 97 Main St., Peabody; Dr. Charles H. Phillips, Health Department, Beverly.

The Treasurer, Dr. F. G. Curtis, presented the following report which was accepted and placed on file:

FRANCIS GEO. CURTIS, *Treasurer, in account with the Massachusetts Association of Boards of Health.*

DR.	
Balance from 1916	$531.91
Receipts for 1917 (dues, interest, etc.)	445.22
	$977.13
CR.	
Printing, postage, etc., for Secretary	$96.32
American Public Health Association for Journals	216.12
Printing, postage, incorrigible consumptives bill	19.68
Printing and postage for Treasurer	13.00
Reporting April meeting	36.00
Legal services (2 years)	300.00
Sundry small expenses	10.00
	691.12
Balance to 1918	286.01
	$977.13

It was unanimously voted that the Association approve House Bill 612 for the control of Incorrigible Consumptives.

The following paper was read:

"Account of the Smallpox Epidemic in Worcester, 1917," Dr. E. H. Trowbridge, Chairman, Board of Health, Worcester, Mass.

The Nominating Committee reported in favor of the following officers of the Association for the ensuing year and it was unanimously voted to instruct the Secretary to cast one ballot for their election:

President, John S. Hitchcock, M. D., Northampton.

First Vice-President, W. G. Kirschbaum, New Bedford.

Second Vice-President, L. M. Palmer, M. D., Framingham.

Secretary, James C. Coffey, Worcester.

Treasurer, F. G. Curtis, M. D., Newton.

Executive Committee, W. L. Young, Springfield; Dr. C. W. Milliken, Barnstable; F. A. Bates, Lowell; Dr. D. D. Brough, Boston; Dr. G. T. Swarts, Providence.

FRANCIS H. SLACK,
Secretary.

THURSDAY, January 31, 1918.

At the meeting of the Executive Committee of the Massachusetts Association of Boards of Health it was voted to reappoint Dr. G. L. Tobey of Clinton as chairman of the Executive Committee and to continue legislative counsel as heretofore at cost of $150.

F. H. SLACK,
Secretary.

* * *

Treatment of Bacilli Carriers.—The author noticed that the serum of patients convalescing from typhoid never contained agglutinins in any proportion when typhoid bacilli could still be found in their stools. This suggested that by artificially increasing the agglutinins it may be possible to free the men from the bacilli. He consequently gave a small injection of antityphoid vaccine. There was always a pronounced general reaction, and the typhoid bacilli disappeared from the stools thereafter. Although his experience is limited, the unfailing success justifies trials of this means of curing carriers of typhoid and possibly of other germs. —L. Preti, *Reforma Medica, 33, 973* (*1917*); *Jour. Am. Med. Assn., 69, 2212* (*1917*).

PHYSICAL PREPAREDNESS.

George B. Young,
Surgeon, U. S. Public Health Service, Norfolk, Va.

THE declaration of war found the nation unprepared for its responsibilities: unprepared in its means, its methods, in its mind and in its men. The means we must now hastily and wastefully provide. The methods will be corrected though at an appalling cost in both money and lives. The unpreparedness of the spirit is passing rapidly and when the long casualty lists begin to come in and bring to every hamlet and countryside the realization of the cost of the great crusade upon which we have embarked it will vanish in the flames of a passionate resolve that never again shall we be found inattentive to the elementary provision for the protection of our national existence.

When we come to consider our physical unpreparedness, however, we realize at once that our deficiencies cannot be immediately or even presently corrected. It is of this phase of our unpreparedness and the methods to be followed in its correction that I wish to speak. Let us appraise the situation before seeking a remedy. What we may call the gross total of our military man-power under the present law embraces all males of from 21 to 30. The net total consists of the number of those physically able to serve that can be spared from the vitally necessary national activities. The law is an absurdly inadequate attempt to meet our real requirements though it may suffice to supply our present necessities; but we must make the best of it we can. We need not bother with the exact figures; indeed, as yet we can only guess the net totals available; but this we do know that before any questions can be settled as to exemption on account of indispensability or dependents the physically unfit must be excluded from the roster. How many of these are there and what are the causes of their unfitness? Complete figures from the first and second drafts are not yet at hand, but it is safe to say that before the culling process is completed 45 per cent of all those drawn will either have been rejected on preliminary physical examination or discharged for physical weakness developed in the earlier days of training. Percentages are to many of us difficult to visualize. Let us say then that for every ten men drawn four and a half will be physically unfit. It may be objected that it is no more difficult to visualize a percentage than to visualize half a man. Those so troubled can say "four men and a pacifist" and let it go at that.

In peace times the regular Army rejects about seven out of eight men who try to enlist but no such rigorous standards are possible with our new national army.

The acceptance of the successful 55 per cent does not mean that the individuals concerned are well developed physically. It merely means that they present no readily discoverable disability and are, therefore, presumably fit to stand the strain of the physical exercises necessary to prepare them to carry seventy pounds on their backs, mile after mile, and have fight left in them at the end.

Many of those rejected have defects that could be more or less readily corrected if there were time and means available. It is one of the most illogical defects of the present law that it fails to make suitable provision for the enlisting of men pending the correction of defects.

For the present, then, we have to accept the condition that nearly half of our theoretical man-power must be unavailable for military purposes. But this is not all. Many of the effectives must be exempted for various reasons. After all deductions are made it is not an improbability that the net effectives obtained by the first two drafts will not be more than 35 per cent of the number originally drawn. No totals of the causes of disability are available at present but enough is known to justify the statement that the great majority of rejections are chargeable either to the direct, or collateral effects, of preventable causes.

So much for the present. Now what of the future? Those short-sighted persons who think that the end of this war will see the end of general military service in this country may just as well get ready to see the truth. Some form of universal military training is as certain to be established in this country as anything can be certain. The million or more men who will return to civil life in the prime of their active life as citizens will do so with greatly enlarged mental horizons, with heightened ideals of national duties and with very much stronger convictions as to the national policies they will support. Add to them the millions of those embraced in their family connections and you have a potential political army that will dominate the legislation of the coming years. A newspaper paragrapher has well warned the slackers that those they now watch as they march away are those they will be voting for during the next generation. Whatever else these men may stand for you can be sure of one thing—they will stand for some form of universal military training or universal military service.

Within the past few days a questionnaire inviting expressions of opinion on the desirability of universal training after the war was circulated among the drafted men of certain organizations in a camp of men from the middle west; 8,900 replied in the affirmative and only 239 in the negative. Almost without exception the men based their opinions upon their observation of the improvement in their own physical condition during their few weeks of training. Let us, therefore, take thought in time that the youth of the nation be prepared for their coming responsibilities.

What do we know of the physical preparedness of those who will be called upon for service during the next ten years? Here again the figures are incomplete, but enough is known of the results of routine physical examinations of school boys in both our urban and rural schools to justify the conclusion that a general examination would show that 40 per cent of the boys have defects sufficiently important to be noted by the examiners. Of course a very large number of the defects noted are of a minor character and a still larger number are of a character permitting a more or less easy correction; but unfortunately experience has shown that only a small fraction of the remedial defects are corrected, with the result that a large proportion of our school boys grow up to manhood with their physical efficiency impaired. The defects, indeed, are very largely of a character that as the years go by become increasingly potent causes of disability.

It is, therefore, inevitable that for the future as in the present not much over half of those who reach military age will be found fit for immediate training unless very radical steps are taken to give them proper preparation during the years from 12 to 19.

What are we going to do about it? The answer is that we must begin at the beginning and take the steps necessary to prepare our boys for the training which they will receive when the times comes to call them for service.

How is this to be done? It cannot be done unless effective steps are taken to give all the boys in the grammar schools and high schools a thorough physical examination, supplemented by provision for the correction of defects, training in personal hygiene and physical efficiency.

During the past year or so there has been a very active discussion of the propriety of introducing military training into the grammar schools and high schools and a great deal of opposition has developed to the idea of such introduction. The educational authorities as a class seem opposed to the introduction of military training in the grammar schools, and a great many oppose such training in the high schools. The opposition, aside from that of the pacifists, has been largely due to the feeling that the time for such training could not be spared from a curriculum already overburdened, and has been greatly strengthened by the fact that a good many prominent teachers of physical culture have taken the ground that military training is undesirable as a method of physical training for growing boys. At the same time most of those who have spoken and written in favor of military training in the schools have overemphasized the value of drill and military exercises generally in the physical development of boys. It seems to me that both sides have very largely overlooked the fact that the object we should seek is the preparation of youth for military training when the times comes for them to seriously undertake it, and not the anticipation of the more or less mechanical phases of military training involved in military drill. In my opinion the real advantage to be derived from beginning in the grammar schools to prepare for military training is that it will involve as a prerequisite to such training a careful examination of the physical status of all the pupils. It is, therefore, really more a question of the intelligent employment of public health officials than of the activities of the drill masters.

If conducted along the proper lines it will result in bringing before the examining officials at the time of enlistment an enormously larger proportion of effectives than present themselves at present. In other words, military training in its earliest stages should be really a preparation for military training, and by just as much as it is successful will the time necessary for intensive training after enlistment be reduced.

A large portion of the time spent on recruits is at present necessarily taken up by the preliminary physical exercises necessary to bring them into such condition as will permit them to stand the strain of active drill. From all accounts the English have found in training their first volunteer armies that even where arms were available it was useless to put them in the hands of the men until considerable time had been spent in the development and hardening process. Of course it is not expected that we will be able to bring our boys to the period of enrollment in such shape that the preliminary stages of their military training can be entirely omitted, but if we begin at the beginning and carry out a proper system of training, checked as to its results by periodically repeated physical examinations, we can certainly both increase the available material and reduce the time now necessarily devoted to the hardening process. It seems to be manifest, therefore, that universal military training will be very wasteful of our human raw material unless the general public is made to understand that the time has come when the medical and sanitary supervision of school children by some combination of state and national agencies is an absolutely fundamental requirement for the development of any satisfactory system of national defense. Of course it is evident that if we could obtain even an approximation to the sort of supervision I have suggested we would enormously promote the general physical well being of rising generations, and in that way would not only increase our military effectiveness but enormously increase our social and economic efficiency. The direct financial savings that would result from such a system are very great; the indirect economic gains are almost incalculable. To mention only one source of saving it is sufficient to call attention to the well-known fact that fully 20 per cent of the money we spend on schools, one dollar out of every five, is wasted because of the retardation of pupils by reason of physical defects. The suggested system of nation-wide medical supervision of schools would insure the prevention of the greater portion of this waste. Again, the greatest obstacles in the way of the increased physical efficiency of citizens generally are the disabilities resulting from preventable disease, notably tuberculosis, malaria, hookworm and the like. Dr. Hastings of Toronto, one of the best informed of our public health officials, estimates that the total casualties in all countries during the first two and a quarter years of the war have been approximately 4,000,000 and that the average annual total of preventable deaths in the same countries before the war was 4,600,000. In other words the normal total of preventable deaths during the first two and a quarter years of the war would have been more than three times the number of deaths occurring in the war.

The kind of preparation for military training which I have suggested would certainly have very largely prevented such a state of affairs.

The immediate object of military training is the defense of the country against visible enemies. The preparation for military training will result in safeguarding us against not only visible, but invisible enemies as well. Putting aside the mental and moral advantages derived from universal training: the order, self control, concentration of purpose; the broadened sense of national responsibility; the deepened sense of human fellowship, and counting only the gain to the national life that will flow from improved physical efficiency, it is manifest that in universal military training when properly prepared and properly conducted throughout all its stages, we will find the most potent influence imaginable for securing physical preparedness for our duties as soldiers, as citizens and as men.

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Industrial Efficiency.—Lee shows curves of output for muscular work attention, monotonous work and night work, in each of which the practice effect and fatigue effect are shown. In factory investigations the American committee, of which he is executive secretary, found instances of a type of output by the individual which showed a striking uniformity daily or weekly with the inference that the worker was not working to his full capacity. This "stereotyping" of output appeared to have complex causes such as the unthinking recognition that a certain amount is enough for a day's work, or the fear that piece rates would be cut, or that soon all available stock would be exhausted, etc. Lee especially emphasizes the point that longer hours do not necessarily mean a greater output. Particularly toward the close of long hour shifts the curve of output dropped remarkably until in the last forty minutes there was very little or absolutely no production. The physiology of industry tells us to introduce recess periods into long spells, to omit Sunday labor, to impose overtime only in rare emergencies, to alternate night shifts with day shifts, that each worker has a rhythm of his own of such character that the greatest output in a plant is gotten by eliminating the faster and the slower individuals, and then adjusting the speed of operation to the common rate.—Frederic S. Lee, *U. S. P. H. Reports*, Reprint No. 448, 1918.

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The Need for Sickness Statistics in War Industries and How to Get Them.—The minimum requirements for useful statistics of morbidity should include (1) exposure, in years or in months, of the workers who should be classifiable according to age, sex and occupation; (2) cases of sickness (at least those causing disability), including (a) sex, age and occupation, and (b) cause of sickness with time of onset, length of disability, and nature of termination. The idea is practicable since a large number of establishments already keep a record of sickness, there is very evident willingness on the part of both employers and labor organizations to coöperate with public health agencies, and it is believed practicable to use the facilities thus already at hand with some central supervising authority to collect the statistics. Such a record of sickness for industries would be of great service at the present time as well as affording a foundation for later development.—B. S. Warren and E. Sydenstricker, *U. S. P. H. Reports*, Reprint No. 452, 1918.

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THE POLITICAL ATTACK ON THE NEW YORK CITY HEALTH DEPARTMENT.

In April, Mayor Hylan of New York City started gunning for the heads of a number of the nine bureaus of the City Health Department. In the interest of economy, he said, he was after the scalps of "high-priced experts." The New York law prohibits the arbitrary removal of bureau chiefs, but the Mayor and his friends had discovered that seven* of the nine bureaus had been illegally instituted, only two being authorized by the city charter. This, in spite of the fact that previous Corporation Counsels had declared the present organization quite legal!

Hylan soon found that he had stirred up a hornets' nest. Letters of protest poured in from all parts of the country, but what counted more, New York City itself was thoroughly aroused. The Committee on Public Health of the New York Academy of Medicine became very active in the defense of the Health Department. Further, about fifty social agencies held a conference and appointed a Committee of Twenty-one with Dr. Lee K. Frankel as chairman, to wait upon the Mayor. The Mayor refused them an interview.

Seeing that the public was behind the Health Department, and that the people would not submit to its disorganization without a great struggle, the Tammany chief cut down his desire for scalps from seven to two—namely those of Dr. C. F. Boldman, director of Public Health Education, and Lucius P. Brown, director of the Foods and Drugs Bureau. Further, by way of "drawing a herring across the trail" so as to confuse issues, says the *New York Times*, he introduced charges of graft; but this bit of strategy fooled no one, coming, as it did, by way of afterthought.

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* General Administration, Preventable Diseases Laboratories, Child Hygiene, Food and Drugs, Public Health Education and Hospitals.

The Commissioner of Health, J. Lewis Amster, M. D., the Mayor's own appointee, resigned, and Dr. Royal S. Copeland was promptly appointed to succeed him. Mr. Brown has kindly been relieved of his office by the Mayor, so as to give Mr. Brown his full time and energies to preparing his defense before the Civil Service Commission.

The final outcome of the investigation ordered by Mayor Hylan is problematical at the time of this writing. The Civil Service Commission is holding public hearings at which the labor organizations and civic bodies represented in the Committee of Twenty-one have appeared and presented their protests.

Whatever the outcome may be it is already evident that the publicity and notoriety given to the Health Department by the Mayor's letter is already bearing fruit. The Department shows signs of disorganization. The efficient personnel which has been built up in recent years is in danger of disruption. The experts in the Department, uncertain of the tenure of their offices, will prefer to look for other positions which guarantee greater permanency. It will be difficult to find men trained in health work to consider service in the New York Health Department by reason of the unenviable notoriety which attaches to these offices.

In his letter, Mayor Hylan directed the Civil Service Commission to make a complete and thorough investigation of the Health Department with a view to correcting every existing evil, removing from the payroll the names of all persons found illegally employed and reducing to their proper status all persons who are enjoying the emoluments of grades higher than those for which they took promotion tests. The President of the Civil Service Commission, in giving out an extract from the Mayor's letter, added a statement in which he said: "The Health Department for several years past has without doubt been a most belligerent violator of the Civil Service Law. New bureaus have been created and high salaries paid without authority of law." The Committee of Twenty-one requested the Mayor to place in their hands copies of the opinions of the Corporation Counsel bearing upon the legality of the appointments in the Health Department. It is well known, however, that former commissioners in making appointments to positions in the respective bureaus, did so under full sanction of the Corporation Counsel. That the legality of such action should be questioned at the present time is deplorable.

If the Overman bill is passed by Congress, creating a Public Health Administrator, comparable to the Food Administrator it is possible that the Federal Government will intervene—a consummation devoutly to be wished.

A. W. H.

AN IMPERATIVE APPEAL FOR MEDICAL OFFICERS.

An urgent and imperative appeal has just been issued by the Surgeon-General of the United States Army, for doctors for the Medical Reserve Corps.

There are today, 15,174 officers of the Medical Reserve Corps on active duty and the Medical Department has reached the limit of medical officers at the present time available for assignment. With these facts before the medical profession of this country, we believe that every practising physician, who is physically qualified for service between the age of 21 and 55 years, will come forward now and apply for a commission in the Medical Reserve Corps.

The Surgeon-General says: "So far the United States has been involved only in the preparatory phase of this war. We are now about to enter upon the active or fighting phase, which will make enormous demands upon the resources of the country." The conservation of these resources, especially that of man-power, depends entirely upon an adequate medical service.

Drafts of men will continually follow drafts, each of which will require its proportionate number of medical officers and there are at this time, on the available list of the Medical Reserve Corps, an insufficient number to meet the demands of these drafts.

The real necessity for the complete mobilization of the entire profession is imperative. It is not a question of a few hundred men volunteering for service, but of the mobilization of the profession for the conservation of the resources of this country. Let every doctor who reads this editorial and appeal from the Surgeon-General, which appeal is based upon dire necessity, act promptly and present his application for a commission in the Medical Reserve Corps at the nearest Medical Examining Board.

J. M., Jr.

PLUMS FOR THE FAITHFUL.

A bill was recently introduced into the Rhode Island General Assembly which would have met the full approval of "deserving" political workers. It was proposed to have a State Board of Health of three members, the president of which was to receive an annual salary of five thousand dollars, and the other members, four thousand each. The Board was to meet once each month or oftener "if deemed necessary," traveling expenses being paid by the State.

The Executive Secretary of the Board was to receive *three thousand dollars* per year, and was to be subject to removal at any regular meeting by a majority vote of the Board.

A total of eleven thousand dollars for the part-time, presumably inexpert, Board members and three thousand for the really vital unit of efficient health administration—the executive!

Could human ingenuity devise a more delightful haven for politicians than a berth on this Board! Likewise, could efficiency in health work possibly receive a prettier knock-out!

Fortunately, it seems that the bill will be defeated.

A. W. H.

THE PAPERS OF THE NEXT ANNUAL MEETING.

A well-informed member of the Association lately expressed high approval of the programs read at the Washington meetings in 1917. General addresses giving nothing new were to a large extent absent, being replaced by real contributions to public health science.

It is a pleasure to transmit this compliment to section program committees and to hope that it may be repeated after the coming Chicago meetings.

Let us have shorter and better programs.

A. W. H.

Association News.

By A. W. Hedrich, Secretary

The American Public Health Association Incoporates.—On April 27 steps were taken to incorporate the American Public Health Association under the laws of Massachusetts as an association not organized for profit. The following persons, residents of the State of Massachusetts, with but one exception, acted as incorporators: Professor W. T. Sedgwick, a former president of the Association; Professor G. C. Whipple, of Harvard University; Dr. E. R. Kelley, commissioner of health of Massachusetts; Dr. Francis R. Slack, a former secretary of the Association; Mr. C. E. Turner, public health agent of the Massachusetts Medical Society; Captain A. N. Thomson, M. R. C.; and A. W. Hedrich, secretary of the Association.

The present officers and directors of the Association will become the officers and directors of the new corporation.

⁂

A Standard Plumbing Code.—The desirability of forming a standard plumbing code has long been evident. To this end, steps have been taken to appoint a joint committee from the National Municipal League, the American Society of Sanitary Engineers, and the Sanitary Engineering and Public Health Administration Sections of the American Public Health Association. The organization of the committee is now in the hands of Mr. Thomas H. Claffey, secretary of the Society of Sanitary Engineers.

A standard code originating from such a committee would immediately have standing and would fill a great need.

⁂

Board of Directors to Meet in Chicago.—The Board of Directors of the American Public Health Association will meet in Chicago on Thursday, June 13, at 2 p. m., at the Morrison Hotel, 79 Madison Street, Chicago. The meeting date is very convenient since it comes at the time of the convention of the American Medical Association, which meets in Chicago, June 10–14, 1918.

A number of very important projects will be considered by the Board of Directors, such as the organization of state health societies, a campaign to increase the membership of the Association to at least 5,000, the work of the proposed new Health Institute of the Association, and plans for the coming annual meeting to be held in Chicago, October 14–17, 1918.

The Association has lately begun to become self-supporting; in fact, if present tendencies continue there will be income for propaganda purposes. The Board of Directors will, therefore, be able to consider certain very necessary activities which for years have been held in abeyance for lack of funds.

HELP WANTED.

In order to help relieve the shortage of sanitarians due to the war, free help wanted announcements will be carried in this column until further notice. Copy goes to the printer on the first of each month.

In answering keyed advertisements, please mail replies separately.

The Health Employment Bureau also sends lists of applicants to prospective employers without charge.

Wanted: Sanitary engineer in southern state. Salary, $2,400. Adress No. 119, D. O., care of this Journal.

Wanted: Epidemiologist as assistant to the Director of Division of Communicable Diseases. Must be a physician and by Civil Service regulations must comply with Ohio laws for medical licensure. Salary, $1,700, with necessary traveling expenses. Address No. 120, F. W. A., care of this Journal.

Wanted: Physicians in southern state board of health to conduct intensive health work in rural districts. Should be young, energetic, have a pleasing personality and a graduate of Class A medical college. Salary, $2,100, with traveling expenses. Address No. 122, C. W. P., care of this Journal.

Wanted: Trained nurse experienced in public health nursing and tuberculosis work in New York State. The work is among the people of the county and a Ford car is provided. Salary, $1,200. Address No. 123, S. P. M., care of this Journal.

Wanted: Sanitary engineer to work along lines of sanitation among Jewish farmers in New York State. Work temporary, lasting through the summer. A man who can speak and understand Yiddish preferred. Salary commensurate with qualifications and duties of the position. Address No. 125, D. G., care of this JOURNAL.

Wanted: Sanitary engineers for extra cantonment zones familiar with the control of malaria. Also sanitary bacteriologists wanted. Address No. 126, B. R., care of this JOURNAL.

Wanted: Lady laboratory official thoroughly posted in food, water, blood, and general diagnostic laboratory work, in western state. Salary, $1,200. Address No. 128, F. M., care of this JOURNAL.

Wanted: Camp sanitarian in West Virginia. Salary to start, $200 per month, with increases as long as his work is satisfactory. Four-room cottage and board furnished. Address No. 129, W. A. J., care of this JOURNAL.

Wanted: Young medical man with some experience in hospital and public health work as assistant superintendent of hospital in Ohio. Salary to start, $2,000, increase if satisfactory. Address No. 130, B. F. O., care of this JOURNAL.

Wanted: Health officer in Middle West. Must be qualified and experienced to have management of 100-bed hospital, tuberculosis hospital, and a contagious hospital. Salary to start, $3,000, with increase. Address No. 131, P. G. C., care of this JOURNAL.

Wanted: In Illinois, bacteriologist experienced in the water purification field, especially having knowledge of ozone. Address No. 132, M. W. P., care of this JOURNAL.

Wanted: Nurse to have charge of baby-house in New York State. Work includes care for a census of between twenty and twenty-five babies under two years of age and direction of training school for children's nurse maids. Salary, $60 per month and maintenance, including laundry work. Address No. 134, H. J. H., care of this JOURNAL.

Wanted: Sanitary engineer for southern state board of health. One familiar with the peculiarities of southern soil preferred. Salary, $2,400. Address No. 119, D. O., care of this JOURNAL.

PERSONAL NOTES.

Mr. Horatio N. Parker, who until recently has been associated with the Health Department of *The Delineator,* is departing for Jacksonville, Fla., where he will become city bacteriologist.

Dr. Charles T. Nesbit, formerly of Wilmington, N. C., has been appointed health officer of Akron, Ohio.

Dr. R. W. E. Cole leaves the Department of Health at Akron, Ohio, in order to become epidemiologist to the State Board of Health at Charleston, W. Va.

James Zetek, professor of biology and hygiene at the Instituto Nacional of Panama, has been appointed entomologist, Board of Health Laboratory, Ancon Hospital, Canal Zone.

Dr. Irving A. Watson, a former president of the American Public Health Association, died during the past month at Concord, N. H. Dr. Watson has for many years been the secretary of the State Board of Health of New Hampshire.

Dr. W. H. Coon has resigned the health officership at Kansas City, Mo., and may be temporarily addressed at Lowell, Mass.

Dr. B. Franklin Royer is acting state health commissioner for Pennsylvania owing to the death of Dr. Samuel Dixon.

Wallace T. Eakins, epidemiologist for the New Jersey State Department of Health, has been granted a leave of absence for the period of the war and has been commissioned as 1st lieutenant in the Sanitary Corps, Camp Greenleaf, Georgia.

L. M. Fisher, formerly with the State Health Department, Harrisburg, Pa., is now sanitary engineer, United States Public Health Service, Washington, D. C.

J. H. O'Neill, formerly sanitary engineer for the Louisiana State Board of Health, has been commissioned as captain in the National Army.

W. L. Stevenson of the Department of Public Works of Philadelphia, has been appointed sanitary engineer in the Department of Health and Sanitation, United States Shipping Board, Washington, D. C.

Dr. Ralph H. Hunt of East Orange, N. J., has received the commission of major and has been assigned to Regimental Infirmary, Camp MacArthur, Waco, Tex.

Fred M. Meader, M. D., of Albany, N. Y., has been commissioned as captain in the Medical Reserve Corps and is stationed at U. S. Base Hospital No. 33, A. E. F.

Martin Dupray, formerly of Akron, Ohio, is with the State Department of Health, Springfield, Ill.

C. A. Haskins of the Kansas State Board of Health has been commissioned as captain and has been assigned to Camp Sherman, Chillicothe, Ohio.

Joel A. Sperry of Urbana, Ill., has been commissioned as 1st lieutenant, Sanitary Corps, N. A.

A. M. Besemer, formerly instructor in bacteriology at Cornell University, has accepted the position of research chemist and bacteriologist for the California Central Creameries, Eureka, Cal.

Dr. E. A. Schlageter of Chicago has been made a 1st lieutenant, M. R. C., and is stationed at Fort Sill, Okla.

William Bradford Buck of Sea View Farms, West New Brighton, N. Y., has left for France and is stationed with the American Red Cross, 4 Place de la Concord, Paris.

Henry Chalmers, formerly of the State Department of Health, Albany, N. Y., is with the United States Tariff Commission, Washington, D. C.

Robert H. Brown of New York City has been commissioned as captain in the Sanitary Corps, N. A., and assigned to the office of the surgeon-general, U. S. A., Washington, D. C.

Dr. C. P. Fryer of Jacksonville, Fla., has been appointed full-time health officer of Pitt County, North Carolina.

*

The following applicants were elected to membership in April, 1918:

Confederation Life Ass'n, Toronto, Ont. (Corporate Member.)

North American Life Assurance Co., Toronto, Ont. (Corporate Member.)

Union Central Life Insurance Co., Cincinnati, Ohio. (Corporate Member.)

Canada Life Assurance Co., Toronto, Ont. (Corporate Member.)

M. E. Barnes, M. D., Chiengmai, Siam, Director, Uncinariasis Campaign.

Gladys E. Vaughan, M. A., Minneapolis, Minn., Bacteriologist, State Board of Health.

Granville R. Boyd, Coateville, Pa., Health Officer.

H. M. Hicks, M. D., Amsterdam, N. Y., Health Officer.

Grace Ross, R. N., Detroit, Mich., chief, Nursing Division, Board of Health.

Caleb M. Saville, Hartford, Conn., Hydraulic Engineer, Hartford Water Works.

Corporation of Glasgow, Public Health Department, Glasgow, Scotland.

A. W. McClave, M. D., Chicago, Ill., Medical Director, National Life Insurance Co. of U. S. A.

Joseph F. Kelsey, 518 Platt St., Toledo, Ohio, Director, Division of Health.

C. E. Gibbs, M. D., Spartanburg, S. C., U. S. Public Health Service.

Books and Reports Reviewed.

The Human Mechanism. *Theodore Hough and W. T. Sedgwick. Boston: Ginn and Company. Second Edition. 1918. Pp. 572. Price, $2.00.*

The first edition of this work appeared in 1906. The fact that its usefulness had scarcely declined with the passing of so long a period is evidence of the foresight and discretion of the writers. The tone was so moderate and the material so sound that little or nothing has required "taking back." Nevertheless it is a great satisfaction to have the new edition and to note some of its valuable features. The revision has been painstaking and is not limited to a few sections.

Many physiological matters which have hardly ever figured in books of this size and grade have been given place here. This does not mean that Doctor Hough is disposed to cite mere curiosities for their own sake; it is rather because his rare judgment has enabled him to see the suggestiveness and the practical applications of many an observation easily set aside as academic. He has recognized the significance of "conditioned reflexes" as few seem to have done. There is an admirable diagram designed to help the layman to compare the molecular patterns of starch and protein. The interesting studies of Hertz on the reactions of the colon are utilized.

In the opinion of the reviewer the exposition of the phenomena of congestion, inflammation, and tissue resistance is the best extant. The discussion of thermal regulation probably deserves the same distinction. In the chapters which deal with communicable diseases new facts are given respecting transmission by insects. It is to be regretted that the vital statistics have not been revised to show the progress achieved in recent years; this, however, is a solitary blemish in a work abounding in excellences.

Percy G. Stiles, Ph. D.

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Fresh Water Biology. *Henry B. Ward, Ph. D., and George C. Whipple. New York, N. Y.: John Wiley & Sons, 1918. Pp. 1111. (Illustrated.) Price, $6.00.*

The appearance of this carefully prepared and well illustrated monograph on North American fresh water organisms marks the first attempt to deal with fresh water life of this continent in its entirety. For students engaged in the study of these organisms in the realm of pure science and to sanitarians making microscopical examination of water, this book will become a deeply appreciated and indispensable manual.

The work has been in preparation for several years and involves contributions of a large corps of collaborators, each chapter being written by a specialist on the group of organisms therein discussed. Special chapters are devoted to a discussion of general biological factors, methods of collecting and photographing, and technical and sanitary problems. The remaining chapters in general follow a definite plan, each being devoted to a single group of organisms. A brief description of the anatomy of the forms is followed by the life history in condensed form and a discussion of their biological relations. There is a synoptic key at the close of each chapter for the identification of species or genera. These keys are carefully prepared and easy to use. Numerous illustrations accompany the description of species. A brief and carefully selected list of essential references follows each chapter. The index is complete with important terms and scientific names used in the text and keys.

C. E. Turner, M. A.

Housing Problems in America. *Presiding of the Sixth National Conference on Housing, Chicago, October, 1917. Published by National Housing Association, New York City. 462 pp.*

Perhaps no feature of the present war-complicated labor problem is more pressing than the emergency housing of vast forces of men newly gathered together. The National Housing Association realized this a year ago and gathered experts from all over the country to discuss housing as a war problem. This series of papers describe how the housing problem has been met abroad and how individual corporations have dealt with their own war-produced housing famines here.

Beside these papers there are perhaps a dozen more relating to more general housing topics, including a discussion of the time-honored question as to which city department shall enforce housing laws. Another section is devoted to Chicago's housing problems.

To read all these papers consecutively gives one a curious picture of how anyone's personal interests affect his judgment of any problem. The varied viewpoints expressed in this book, city planners, architects, social workers, engineers, camp superintendents, health agents, doctors, and clergymen, are striking in their many conflicts. Even more striking is the entire omission of any representation of the people for whom the houses are supposedly to be built.

Eunice Burton Armstrong.

*

Household Management. *Florence Nesbitt. New York: Russell Sage Foundation Co., 1918. 172 pp. Price, .75 cents.*

Recent investigations of actual food-conserving in the home show that the rich are saving a little, the middle class more in proportion, but that the great mass are saving, in the sense of conserving, not at all.

In these times of high prices there is a tremendous amount of malnutrition, not only in the lowest-income homes but quite as often in those families whose income would suffice to provide proper food, were it intelligently expended. The coöperation of the great majority of its citizens is needed by this country in its food-saving work. The Russell Sage Foundation's second volume in its new Social Work

Series, Household Management, by Miss Florence Nesbitt is planned to teach those very citizens how to get the most food for their money. Any one, doctor, nurse, insurance agent, Red Cross Home Service worker, or any other "social worker" will undoubtedly be grateful for this little book. The five tables which it contains make the book exceedingly valuable. They are given in simple, direct, practical English. Copies might be handed directly to an almost illiterate housewife. The use of the word "ounces" rather than "tablespponfuls" is perhaps unfortunate but with this exception these simple rules are admirably suited to form a basis for lucid explanation of the best household management.

Miss Nesbitt says that "whatever is necessary for the health,—physical and mental,—of the family, and for the unity of its life, is essential to successful home-making, while things not necessary for these purposes, however desirable, are unessential. These five tables of simple rules for successful home-making concern regulating the diet; food, from the standpoint of nutrition, and economy; necessary cooking operations; standards of household equipment; and suggestions for a talk on milk.

The book abounds in concrete illustrations and also contains a discussion of the different dietaries of various nationalities. The difficulty of approach for the average social worker who is young, unmarried and childless is emphasized, since women of the poorer class distrust advice not founded on personal experience, and the wisdom of using health needs as the entering wedge is pointed out. Miss Nesbitt reminds the enthusiastic social worker of the danger of superimposing alien standards and says the mother has very likely never connected her children's ill health with the way in which they have been housed, fed and cared for. She must be led to make this connection.

Beside the usual details of food-content, excellent suggestions regarding housing and clothing are given. The mistakes of judgment which an outsider can make through failing really to understand the difficulties which must be met are clearly shown.

Such a book as this is as valuable as would be a series of conversations on various aspects of her experience and her work with such an expert as Miss Nesbitt.

Eunice Burton Armstrong.

*

How to Keep Fit in Camp and Trench. *Colonel Charles Lynch, M. C., U. S. Army, and Major James G. Cumming, M. O. R. C., U. S. Army. Philadelphia: P. Blakiston's Son & Co., 1918. Price, 30 cents.*

This little book of some seventy pages was written to provide the enlisted men with information in succinct form, at present only obtainable in larger text books covering military sanitation. The small size of the book means that most of the non-essentials have been eliminated. The subject matter is presented in a style approaching the conversational. There is much detailed new material which is of interest to the medical officer as well as the enlisted man.

Perhaps the overemphasis laid upon such matters as the relation between typhoid, dysentery, and cholera organisms and dust may be explained by the type of reader for whom the book was intended, and the necessity of dwelling upon the dust menace. No mention, however, is made of dust *per se* as a menace to health.

An introductory chapter treats of disease organisms and the avenues by which they pass from person to person.

The first two chapters, on Camps at Home, discuss such topics as shelter, water, wastes, personal hygiene, insect pests, etc. The third chapter discusses in three pages those things of sanitary interest to the soldier travelling by rail or sea. The fourth chapter, on Camps and Quarters Abroad, presents much in detail that is new. The chapter closes with a brief discussion of some of the trench diseases. The last chapter treats in a little over a page of first aid.

There are but few typographical errors. On the whole, the work should serve a distinctly useful purpose in the field for which it was intended.

J. P. Bill, M. D.

Stories from the Day's Work.

THE JUDGE'S CONVERSION.

When I became Chief Health Officer of Richmond, in July, 1906, there was so little in the way of a health department that I had the job of building up an entirely new organization. As soon as I had had time to study the situation and see along what lines the greatest good could be accomplished by the least outlay, I recommended to the City Council, through the Board of Health, the adoption of an ordinance creating the positions of Medical Inspector, Registrar of Vital Statistics and stenographer.

In spite of the fact that salaries of these three positions amounted to only $3,300 a year, I knew I would have great difficulty in getting this ordinance adopted, as we had in the City Council a number of men who had no conception of the real work of a modern municipal health department and who regarded as sheer waste of the city's funds every dollar appropriated for health work.

I especially feared the vote and influence of the president of the Board of Aldermen, Judge Turpin, then Mr. Turpin. I knew that he looked on all health work as a mere fad and he had the reputation of never changing his mind. He also had the name of the watch dog of the treasury.

I therefore decided to take the bull by the horns and go to see Judge Turpin. He met me with the salutation: "If you have come to see me about that health ordinance you might as well save your breath. I am going to do all I can to beat it. All this health business is damn nonsense and Richmond hasn't got the money to spend that way."

All that I could say in reply was listened to with ill-concealed impatience. "No," he went on, "you can count on my getting out of the chair and opposing this ordinance from the floor."

It was plain that all ordinary means of persuasion were useless. Hence, in spite of having a very slight acquaintance with Judge Turpin, I boldly replied: "No, you are not going to speak against that ordinance; you are not even going to vote against it. As a matter of fact you are not only going to vote *for* it but you are going to champion it from the floor. I can see you now singing, 'He took my feet out de miry clay!' "*

Confidently as I had spoken, I was actually very doubtful. I realized that, at best, I had quite a job ahead of me, so I tackled it in stages. When I next saw Judge Turpin I got him to agree that he would at least not actively oppose the ordinance, though he still insisted he would vote against it in spite of all I could say. A week later I got him just a bit wobbly as to how he would vote. This was not enough. I needed several more votes than were in sight and I felt that there was no way of landing these unless I could get the president's active support from the floor.

One week before the momentous night when the ordinance was to come up in the Board of Aldermen, I took Judge Turpin a copy of Seaman's "The Real Triumph of Japan" and got him to consent to read it. I was sure he would be deeply impressed by Seaman's statement that in the war between Japan and Russia only one Japanese soldier had died of disease to every four killed, thus reversing the record of all previous wars, with four deaths from disease to every one from bullets. This result had been secured by the health work of the Japs.

Only one thing more remained to be done. On the last morning before the meeting of the Board of Aldermen I addressed the following short note to Judge Turpin and assured myself that he received and read it:

"*Dear Judge Turpin*:

"I am not going to take up much of your time. I want to ask you just three questions:

"(1) Do you not believe that American public health men are as capable as Japanese army surgeons?

"(2) Do you not believe that the lives of Richmond citizens are as well worth saving as are the lives of Japanese soldiers?

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* Not so many years ago, as all Southerners remember, when darkies "got 'ligion" they went out on the street and, stopping every passerby who would stay to listen, they stood shaking his hand and telling of their conversion from sin to salvation. Chief place was given to an ecstatic account beginning: "He took my feet out de miry clay and sot 'em on de firm rock o' ages, whar de win' may blow and de storm may rise, etc."

"(3) If you answer these questions in the affirmative, will you not give your *active support* to the health ordinance which comes up tonight before the Board of Aldermen for concurrence?

"Very respectfully,
(Signed) "E. C. Levy, M. D.,
"*Chief Health Officer.*"

It was well on to midnight when the Clerk droned: "An Ordinance to Amend and Reordain an Ordinance Approved June 18, 1906, entitled 'An Ordinance Creating a Board of Health, Defining Their Powers and Duties, etc., etc.," and I knew the time had come for a showdown.

As the clerk finished reading, Judge Turpin took the floor. I knew I had won, but it was another instant before I knew how complete was my victory and how perfect my prophecy, for I then heard Judge Turpin address the chair:

"Mr. Chairman:
'While the lamp holds out to burn,
'The vilest sinner may return.' "

I knew that Judge Turpin's conversion was complete. He carried with him another member who had sworn he would vote against the ordinance, and it passed with not a single vote to spare.

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CALLING AN ANTIVACCINATIONIST'S BLUFF

In a neighboring city not far from Chicago there reside a considerable number of antivaccinationists. Some years ago smallpox came along to remind them of their folly and neglect. The health officer in this town knew what was needed and proceeded to vaccinate school children, factory employees and citizens in general.

The antivaccinationists called a meeting to protest against this action. They met in the city council chamber. The prominent citizen, a few lawyers, a doctor or two, and many women were present. The health officer had sent for me to come out and do some talking.

The meeting was called to order and the object of assembly stated. Speeches protesting against vaccination were made and then I was invited to speak. I told them many things I thought they needed to know. One of the things I told them was that a person vaccinated and revaccinated would not contract smallpox.

At this statement a man in the audience rose up and said that an exposed person would not necessarily get smallpox even if he were not vaccinated. He said that he had never been vaccinated, had spent an evening in a room with a smallpox patient, and did not contract the disease. He said that vaccination did not protect from smallpox anyway. His sympathetic audience thought I would not be able to explain away such an experience. I replied to him that occasionally a man might be immune from smallpox, but that the chances of an unvaccinated man escaping from smallpox after an evening's exposure to the disease were so slight that I would have to inquire into the matter a little farther. I did not doubt his word, but feared he was mistaken about some things.

I took a ten dollar bill out of my pocket and held it up where all could see it. I then said: "Assuming what you have said to be true, *i. e.*, that you were in the same room with a case of smallpox during an evening and that you did not contract smallpox, I will bet ten dollars that you had been vaccinated." He again denied that he had been vaccinated. The crowd howled and assumed that I had lost, but I stuck to the man and told him he would have to show his arm before I could be convinced. I insisted that he show his arm and so got part of the crowd with me. When he saw he was cornered and would have to strip, he stated he had been vaccinated, had nearly lost his arm and had a scar as large as a half dollar. After that, the crowd did not have much to say.

The average antivaccinationist does not hesitate about lying when he attempts to bolster up his views upon vaccination. The man had deliberately lied and I was determined the audience should know it. I ran but little risk of losing the ten dollars though I had to take his word for what had happened at the time he was exposed.

The newspapers next morning gave him the worst of it. Did that audience learn anything? Some did, but the antivaccinationists that went there were antivaccinationists when they came away. Probably they still are.

Heman Spalding, M. D.,
Chief, Bureau of Medical Inspection,
Department of Health, Chicago.

CHANGING MISUNDERSTANDING INTO COÖPERATION.

The newly organized State Health Department of Maine decided, in June, 1917, to institute sanitary inspection of hotels.

The hotel men were unfavorable to inspection. They had visions of costly reconstructions, new plumbing and ventilation apparatus, and special bed linen. They fancied themselves "bossed around" by an impractical inspector, who would advertise their shortcomings to the world.

As the Maine Hotel Association had three times defeated bills for state hotel inspection, it was clearly necessary for us to dissolve this antagonism. Accordingly we had a conference with the officer of the Association and demonstrated that, far from being a menace, hotel inspection was really a great benefit to the hotel owners. The State Health Department proposed to prevent epidemics which hurt business; to furnish expert advice for overcoming sanitary difficulties in the least expensive manner; and to give Maine a reputation for safe and attractive hotels from the health standpoint, so that more visitors would come to Maine than ever before.

When he understood our aims, the president of the Maine Hotel Association offered every possible assistance. The secretary of the Association even sent out a circular letter urging the coöperation of all hotel owners, and at the annual meeting of this Association, a set of rules and regulations presented by the State Department of Health were unanimously endorsed. These rules are now a part of the public health law of the state.

These hotel men, who formerly blocked all attempts at hotel inspection, are now loyal friends to the State Health Department, and may be depended upon for enthusiastic coöperation.

The incident suggests that many of the difficulties which clog the wheels of public health progress arise from the lack of mutual understanding, rather than from obstinacy.

C. E. Turner, M. A.,
Formerly Special Field Agent of the Maine State Department of Health.

—OR MUST WE USE MALLETS?

This is a story of how we ourselves were brought to see the light.

It has been the aim of our department for some time past, to distribute typhoid vaccine. Upon request, we also administer it. This offer was repeatedly made to physicians by letter and otherwise, and to the public through the newspapers in free and paid space, the Department "Bulletin," the "movies," by word of mouth and otherwise. When a case of typhoid is reported, every member of the family excepting the patient is specially urged to take the treatment.

Last summer a case of typhoid was reported in a boy of a poor family. The case was visited and the mother urged to take the typhoid vaccine, but the usual excuses were advanced by her. However, we were able to induce her to change her mind, and together with three children she was given the vaccine by us, because the attending physician was too busy.

When the third dose was administered, and her fears of intense pain, swollen arms, illness and many other imaginary pains had been allayed, the mother wanted to know why people objected to taking the vaccine and why she had not been informed before of the existence of a material that would have prevented a doctor-bill and drug-bill, aside from the danger of losing a child, and the worry connected thereto. We assured her that every physician knew about it, that it had repeatedly been spoken of in the daily newspapers, and that she and her children undoubtedly had seen information concerning it in the movies. However, the fact remained that she did not know of it and in consequence had been made to suffer.

We have, therefore, come to the conclusion that there remains but one way in which to get health information to the general public, and that is through visits to the homes by nurses who are trained in the art of handling people, and who can spread the gospel of good health and tell what the health department has to offer.

Max J. Colton,
Health Officer,
Cumberland, Md.

Public Health Notes.

Abstracts by M. E. Champion, M. D., David Greenberg, and M. P. Horowitz.

Whooping-Cough Vaccine.—Vander Bogert, writing in the *American Journal of Diseases of Children* for April, tells of his experience with vaccine in the prevention of whooping-cough. A child in the Children's Home in Schenectady, N. Y., exposed forty-five other inmates to whooping-cough for a period of one week. The diagnosis was based on the whoop, vomiting with the cough, a lymphocytosis of 61 per cent, and a smear from the pharynx showing organisms reported suspicious of the Bordet-Gengou type.

Of the forty-five children exposed, thirty-one gave no record of having had the disease, though later one was found to have had a past infection. These thirty-one children were inoculated December 3, 1917, each with 50 million plain stock pertussis vaccine. No untoward effects were experienced. No cases had developed among those so treated, up to January 24, 1918. (*M. E. C.*)

*

Physical Education in the Secondary Schools.—In *Bulletin 50, No. 1917, of the Bureau of Education*, Department of the Interior, there appears the report of the Commission on the Reorganization of Secondary Education appointed by the National Education Association. The health program which is recommended may be divided into four groups:

1. A careful health examination which should include:

a. Medical inspection;

b. Mental examination to determine whether the pupil is normal, subnormal or supernormal;

c. Physical examination, which includes the tests for eyesight, hearing, weight, height, bodily strength, lung capacity, and cardiac efficiency.

2. A healthful environment in home and school. This must consider whether an adequate and wholesome diet is available, as also good sleeping and living rooms and properly maintained school rooms.

3. Instruction in health problems, including such subjects as diet, care of teeth, sex, sleep, exercise, bathing; room temperatures, ventilation, dust, seating, posture; sewage disposal, water supply, milk supply, and control of infectious diseases.

4. Physical activity:

a. Equipment, minimum requirement;

b. Amount and kind, minimum requirement;

c. Kind of exercise. (*M. P. H.*)

*

Physical Education in Public Schools.—The appalling amount of physical defects disclosed by the draft examinations has led the Massachusetts State Board of Education, backed by a large number of private organizations, to introduce a bill providing for more extensive physical education in the public schools. The bill provides for a director and two assistants (one a woman) appointed by the State Board of Education, who shall have general supervision of physical education and shall outline the work. Physical education is made to include games, athletics, instruction in personal hygiene and sanitation. Not less than two hours a week are to be devoted to this work.—*The Survey*, March 6, 1918. (*D. G.*)

*

Source of T. B. Infection.—The 1916 Annual Report of the chief tuberculosis officer for Birmingham, England, quoted by the Medical Officer, gives the results of an investigation into possible sources of infection of 2,744 new cases of tuberculosis. The percentages he gives are: from brothers 9.03; fathers 8.12; sisters 7.10; mothers 6.84; daughters 1.42; sons 1.09; wives 0.98; husbands 0.87. (*M. E. C.*)

*

The Draft and the Nation's Physical Stamina.—It has always been assumed that the people in the cities were healthier than their brethren in the country. Thus it was said that 1 per cent of the city children as against 3.7 per cent of country children were afflicted with lung trouble; 0.13 per cent of the former as against 3.5 per cent of the latter, for spinal curvature; twice as much mental defectiveness, five times as much ear trouble, four times as many eye defects, three times as many enlarged tonsils and adenoids, twenty times as much caries of the teeth, and 8 per cent more malnutrition are attributed to the country children in comparison with the city children.

In the first draft, about 2,500,000 men were examined for service of which 71 per cent were accepted and 29 per cent rejected. An analysis of the figures in ten states, where there is not a large foreign element, showed that in the urban areas, 71.53 per cent were accepted and 28.47 per cent rejected, while in the rural areas, 72.04 per cent were accepted and 27.96 per cent were rejected. Assuming the more usual dividing line for urban vs. rural districts than had been assumed by the Provost Marshal General, Dr. E. N. Clopper found that in ten different states, 73.4 per cent of those examined from urban districts were accepted and 26.6 per cent rejected. Exactly the same percentages were found for the rural districts. Therefore the country boy is apparently just as healthy as the city boy. The manufacturing states of New England and the East made the worst showing in the physical examinations.

The article appears in *Child Labor Bulletin* for February, 1918. (*M. P. H.*)

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Outdoor Sleeping Porches.—Because of inadequate sanitarium facilities the Municipal Tuberculosis Sanitarium has under consideration a plan to secure an outdoor sleeping porch for every consumptive in Chicago. According to this plan each church has agreed to provide warm bedding for at least one tubercular person of its congregation. Where necessary a sleeping porch will be equipped by the Sanitarium, complete with canvas curtains, cot and mattress. The Sanitarium will send a nurse to demonstrate the making of the approved "Klondike" bed for outdoor sleeping.—*Monthly Bulletin*, Chicago Mun. Tub. San., March, 1918. (*D. G.*)

⁂

Midwifery Increase in England.—The *Medical Officer* for March 9, 1918, gives a summary of the results obtained in the administration of the Midwives Act in Straffordshire, England, last year. During the year 297 women were practicing; they attended approximately 64 per cent of the total births in the county, representing 10,632 cases. Medical help was sent for in 1,291 of the cases presenting abnormal features. These figures show a progressive increase over the figures of other years, and, according to the local health officer of the county, admit of the inference that the midwives are benefiting by the instruction of the inspectors and are developing an increasing sense of responsibility. (*M. E. C.*)

⁂

The Social Unit Plan.—The National Social Unit Organization describes in its *Bulletin No. 4* the social unit plan adopted in the Mohawk-Brighton District of Cincinnati. The plan is to make people in cities more neighborly and more interested in each other's welfare, by organizing the social forces in a district. The experiment will be conducted for three years, and $135,000 has been appropriated for the work. It is hoped that by this plan health and happiness will be increased, whereas poverty, misery, disease and preventable deaths will be diminished. (*M. P. H.*)

⁂

Feeding Garbage to Hogs.—The Canadian Commission of Conservation has issued a special report entitled "Garbage as Feed for Hogs." In this report, the Canadian and American experiences are reviewed. In Canada the general practice is to sterilize the garbage before feeding, by boiling. In America, the garbage is fed raw, but the hogs are immunized against hog cholera by serum and virus treatment. The experiences of Worcester, Mass., and Grand Rapids, Mich., are recorded in detail. Garbage is always collected in water-tight, covered steel wagons, and cleanliness in the hog pens is practiced. It is estimated that one ton of garbage will feed 45 hogs per day. Some attempts have also been made to raise cattle and sheep on garbage, but with varying success. (*M. P. H.*)

⁂

The Problem of Our Infant Population.—Dr. H. E. F. Locke, writing in the *American Journal of Nursing*, April, 1918, emphasizes the need of welfare work in connection with the problem of infant mortality. Welfare work should not in any sense convey the idea of charity, but in its broadest sense means the teaching of people to become self-reliant and to do things better and more intelligently. That "a child must be born before it can be saved" is not strictly true. By proper prenatal instruction and observation of prospective mothers the number of stillbirths could easily be reduced

50 per cent. The time may come when the confidential registration of pregnancy at not later than the fifth month, with the district welfare bureau would be compulsory. What a wonderful means of combating infant mortality such a requirement would furnish! (*D. G.*)

⁂

Induced Diagnostic Eruption in Measles.—Godlewski gives a colored plate of the findings when dry cupping is applied to the chest or back for thirty, forty or fifty seconds. On 200 healthy persons there was left a whitish ring where the cup had rested. When applied to a person during the incubation stage of measles, three days before the eruption appeared, a reddish ring was seen, the skin looking as if it were stippled with red in the form of a circle. If applied forty-eight hours before the eruption, the red circle is much wider and the color deeper; twelve hours before the eruption the red circle is still wider and the color veers more to purple. This induced erythema reaches its height in three and a half minutes and then subsides, lingering sometimes up to ten minutes. This test was applied to 218 persons and the eighteen giving a positive reaction developed a typical measles eruption four or five days afterward. The subjects included children and adults; in each case there was nothing to suggest measles at the time except this ring of induced erythema. The color deepens the closer to the date of the measles eruption. Godlewski relates that ten cases of what seemed to be measles developed in epidemic form in one barrack, but this cupping glass test was negative, and the assumption of measles was disproved by the course of the cases. He has had no opportunity to apply the test thoroughly in scarlet fever, but it was negative in the two cases tested. If time and experience confirm the reliability of this reddish crown induced by the cupping glass as a sign of incipient measles, it will prove useful in camps and institutions to weed out the cases of measles without waiting for the eruption.—*Jour. A. M. A.* From *Bulletin's de la Société Médicale des Hôpitaux, Paris, Nov. 23, 1917, 41, No. 32.* (*M. E. C.*)

⁂

Malnutrition Among School Children.—The Bureau of Child Hygiene of the New York City Department of Health has just completed a survey of 171,619 school children, made for the sole purpose of determining the condition of nutrition of these children. Of the number examined 17.3 per cent were found in normal condition as regards nutrition, 61.1 per cent were passable or border-line cases, 18.5 per cent were seriously affected with malnutrition, and 3.1 per cent were in a bad stage of malnutrition. It is pointed out that this condition has been increasing in seriousness for the last year and a half and has resulted mainly from the fact that the increase in wages has not kept pace with the decrease in the buying power of the dollar for food. The condition is one which can be met in two ways: (1) by helping the mothers of the city to understand how they may, within their limited incomes, purchase and prepare food for their children, and (2) by the school lunch system.—*Weekly Bulletin*, N. Y. City Health Department, March 9, 1918. (*D. G.*)

⁂

A Four-Day Free Public Health School will be conducted by the Public Health Committee of the Massachusetts Medical Society, May 28–31, 1918. Lectures will be given at Huntington Hall and at the new Technology buildings by experts from federal, state and local health agencies. An attractive program has been prepared by Mr. C. E. Turner, the agent of the Medical Society.

A similar school held last year attracted a very satisfactory attendance from health officials.

The topics include water and sewage purification, the public health laboratory, specific diseases, public health reports, industrial hygiene, child welfare, and public health administration.

⁂

The Illinois Vigilance Association has issued four pamphlets on the problem of venereal diseases for inexpensive or free distribution, as circumstances may require.

Copies will be sent free of charge to anyone sending a self-addressed and stamped envelope. The Association is a welfare organization incorporated "not for Profit."

The pamphlets are as follows: "Lord Kitchener's Instructions to Soldiers"; "Three Great Army Records"; "For Our Sons," a translation from the French by Prof. Alfred Fournier; "For Our Daughters," a translation from the French by Dr. Charles Burlureaux.

Speakers Wanted.—The Council of National Defense desires to obtain a list of speakers qualified to address civilian audiences upon the subject of "Social Hygiene and the War." Those who wish to volunteer their services are urged to communicate with Dr. Franklin Martin, Member of Advisory Commission, Council of National Defense, Washington, D. C.

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A. M. A. Meets in Chicago.—The American Medical Association will hold its next convention at Chicago, June 10–14, 1918. The following Executive Committee is in charge of local arrangements: Dr. Ludvig Hektoen, Chairman, Dr. Charles J. Whalen, Secretary, Wm. A. Pusey, Treasurer, John V. Fowler, Hugh T. Patrick, Malcolm L. Harris, Frank Billings, James B. Herrick, Chas. E. Humiston.

The Committee emphasizes the value of the five days of clinics which will begin on Thursday of the preceding week and will continue up to Tuesday of the Convention week. These clinics will be conducted by clinicians of prominence.

The General Headquarters will be at the Hotel Sherman.

Readers of this JOURNAL will be especially interested in the Section Meetings for Preventive Medicine and Public Health to be held at the Auditorium Hotel.

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Undue Toxicity in Arsenic Products.—Director G. W. McCoy of the Hygienic Laboratory, U. S. Public Health Service, requests that samples of any lots of arsphenamine and neoarsphenamine which have shown undue toxicity be forwarded to the Hygienic Laboratory for examination.

In sending these samples it should be ascertained that the lot number is the same as that of the ampoules used on patients. The samples sent should, if possible, be accompanied by a brief note stating the approximate body weight and age of the patient, the dose and dilution of the drug given, the symptoms and result; that is, whether fatal or not.

⁂

Public Health Courses at Harvard-Technology.—A special course for inspectors of the Boston Health Department was begun on April 22, under the joint auspices of the Lowell Institute and the Harvard-Technology Public Health School, at Cambridge, Mass.

The course covers six weeks of lectures by Professors Sedgwick, Rosenau, Whipple, Mr. C. E. Turner, and others.

During the past five years the Harvard-Technology School of Public Health has had sixty-seven students and has issued thirty Certificates in Public Health. Starting with a membership of only five the first year, it increased to 25 in 1916–1917. Like other schools it has contributed its quota to the national service so that at present its membership is less than a year ago, the number of matriculants being 15.

Some of the graduates of the School of Public Health have found positions as health officials in the federal, state and municipal service; others are in foreign service. The demand for public health workers has become so great and the opportunities for such men in public health work have increased so much as a result of the work that it has been decided to keep the school open during the coming summer.

⁂

Women Bacteriologists Wanted.—There is need for about 100 women bacteriologists to take the place of men in the cantonment laboratories, the Surgeon General's Office of the United States Army announces. The service of the men is demanded for the hospital units which are going abroad and their places at the home cantonments are to be filled by women. Applications are arriving from all camps, some asking for as many as nine women. A good practical knowledge of clinical pathology and diagnostic bacteriology is required for the work. The present salary is $720 with maintenance and $1,200 without, with transportation furnished by the government. Applications may be made to Office of the Surgeon General, Washington, D. C.—*Science.*

⁂

Health Surveys in Oklahoma.—The surveys are in charge of M. P. Horowitz of the Department of Biology and Public Health, Massachusetts Institute of Technology, and Dr. Gayfree Ellison, Professor of Bacteriology and Hygiene of the University of Oklahoma. The investigators are assisted by members of the executive and nursing staff of the State Association, as well as by the staff of the State Board of Health and the Board of Agriculture. The surveys which began on April 1, will be continued through the month of September. The following towns are included in the series: Oklahoma City, Tulsa, Muskogee, Enid, Shawnee, Bartlesville, Ardmore, Chickasha, and McAlester.

⁂

Anti-Tuberculosis Training for Registered Nurses.—The Missouri Association for the Relief and Control of Tuberculosis gives official expression to the sense that all applicants for the degree of Registered Nurse should be qualified by instruction in the characteristics and prevention of tuberculosis and be systematically trained in the care of tuberculosis cases. This instruction and training, they believe, should be made obligatory and requisite to obtain the degree or to be entitled to officially register as a private or public nurse.

⁂

Seizes So-called Hog-Cholera Remedy.—Seizures of sixty-two cases of a so-called hog-cholera remedy in Iowa and North Carolina upon order of the federal courts mark a determined effort on the part of the United States Department of Agriculture to stop interstate traffic in so-called hog-cholera remedies which do not cure, prevent nor control this disease which has such an important bearing on the nation's pork supply. The seized goods are now in custody of United States marshals pending action under the Food and Drugs Act. The government charges that this remedy will not prevent or cure hog cholera, as claimed on the labels of the seized products.

The Bureau of Animal Industry, through its veterinarians and experts in animal diseases, is coöperating actively with the Bureau of Chemistry in this campaign to control interstate traffic in fraudulent stock remedies.

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Washington Conferences.—The state and territorial health officers will meet in Washington, D. C., June 3 and 4, in response to the call of the Surgeon General, U. S. P. H. S. This meeting will be followed by the Conference of State and Provincial Boards of Health of North America, June 5 and 6.

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Public Health Laboratory Notes.

Abstracts by Arthur Lederer, M. D.

APPARATUS AND TECHNIQUE.

An Improved Automatic Pipette-Washing Device.—Since the publication of an article in the *Jour. Ind. Eng. Chem. 9, 1046 (1917)* the author has designed a modified form of the apparatus referred to, which embodies several improvements. The points in superiority of this device over the one previously described are: (1) greater capacity, (2) smaller table space occupied, (3) lower first cost, (4) cleansing of both outside and inside of pipette. Such an apparatus is particularly useful in serological work.—A. V. Fuller, *Jour. Ind. Eng. Chem. 10, 297 (1918).* (A. L.)

⁂

A New Culture Medium for the Gonococcus.—Agar, containing human plasma, instead of blood, is proposed.—D. Thomson, *Brit. Med. Jour. No. 2948, 869 (1917); Abst. Bact. 1, 511* (1918). (A. L.)

A Procedure for the Demonstration and the Rapid Determination of the Diphtheria Bacillus in Patients and Carriers.—In an attempt to overcome the difficulties offered by similarity in morphology of the pseudodiphtheria bacillus a special differential medium is suggested. It is based upon the idea that the true diphtheria bacillus ferments dextrose while the diphtheroids do not. The medium sterilized at between 75 and 80 C. has the following composition:

Horse serum	100 cc.
Sol. of dextrose, 30 per cent, sterilized	10 cc.
Sol. of sulfuric acid, 1 per cent sterilized	3 cc.
Conc. litmus sol., sterilized	30 drops

—S. Costa, J. Troisier and J. Dauvergne, *Compt. rend. Soc. de biol., Par., 80, 678 (1917); Abst. Bact. 1, 511 (1918).*

(A. L.)

A New Wassermann Water Bath.—Such an instrument is offered by E. Leitz Inc., New York City, under the trade name "ELEI" Wassermann Water Bath. It combines an extremely compact size with a capacity (144 tubes) large enough for the routine laboratory, while those baths usually offered are considerably smaller in their capacity. The bath is offered for gas, oil and electric heating.

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Two Procedures for the Rapid Demonstration of Crescents in the Blood of Patients Suspected of Malaria.—Both methods are based upon the property of alcohol of dissolving the red corpuscles and at the same time fixing the film to the slide. The first method will be used if a centrifuge is available. Hemolyze the blood in 33 per cent alcohol, letting the blood run directly into the alcohol in the proportion of 2 drops to each cc. Centrifuge, wash the sediment again and stain it with ammoniated polychrome blue or alkalin methylen blue. If a centrifuge is not available deposit a large drop of blood at one end of the slide and streak the blood along the whole length of the slide. Allow this to dry in the air, wash out the hemoglobin with 33 per cent alcohol, fix with stronger alcohol and stain as above.—L. Tribondeau and J. Dubreuil, *Compt. rend. Soc. de biol., Par., 80, 494 (1917); Abst. Bact. 1, 513 (1918).* (*A. L.*)

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A Simple Device for the Growth of Anaerobes on Plates.—An arrangement is described whereby a false bottom can be placed in a Petri dish, under which a deoxidizing agent, such as pyrogallic acid, can be used.—H. Henry, *Brit. Med. Jour. No. 2945, 762 (1917); Abst. Bact. 1, 514 (1918).* (*A. L.*)

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Shipping Water Samples.—Description of a double walled insulated galvanized iron box for shipping water samples.—Mayo Tolman, *Munic. Jour. Balt., 43, 29 (1917).* (*A. L.*)

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A New Apparatus for Aseptic Ultrafiltration.—A convenient form of filter apparatus by means of which an aseptically filtered juice may be obtained, is figured and described.—R. E. Smith, *Phytopathology, 7, 290 (1917); Physiol. Abst. 2, 541; Chem. Abst. 12, 705 (1918).* (*A. L.*)

BACTERIOLOGY AND PATHOLOGY.

Von Dungern's Indigo Test for Syphilis.—F. found the test originally described by Von Dungern (*Muenchen. med. Wchnschr.* Sept. 1915) particularly unavailable for the serum diagnosis of syphilis, because no difference could be found as to the test between syphilitic and nonsyphilitic sera.—B. Fujimoto, *Jour. Immunol. 3, 11 (1918).* (*A. L.*)

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Preservation of Typhoid Bacilli in Stools.—Benians' experiments support the work of Teague and Clurman, and show that if fecal specimens destined to be examined for the enteric organisms have to submit to delay in transport or for any other reason, it would be well if they were first emulsified in 30 per cent glycerin; a positive result is then much more likely to be obtained. This is especially true in warm weather and in hot countries.—T. H. C. Benians, *Lancet, London, 1, 255 (1918); Jour. A. M. A. 70, 961 (1918).* (*A. L.*)

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Survival of Poliomyelitic Virus in Brain.—The experiments recorded by Amoss provide additional reasons for concluding that the streptococcus cultivated from cases of poliomyelitis differs essentially from the filterable virus and is not the microbic cause of epidemic poliomyelitis.—H. L. Amoss, *Jour. Exper. Med. 27 443 (1918); Jour. A. M. A. 70, 1037 (1918).* (*A. L.*)

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Parameningococci.—Bloch and Hebert relate that in the cases of epidemic meningitis on the eastern firing line parameningococci are often found. They agglutinate specifically and yield only to a bivalent antiserum. Netter's experience (*Bull. de la Soc. Med. des Hop. 41, 1231 (1917)* also emphasizes the efficacy of polyvalent antiserums.—M. Bloch and P. Hebert, *Bull. de la Soc. Med. de Hop. 41, 1229 (1917); Jour. A. M. A. 70, 1040 (1918).* (*A. L.*)

Tuberculin Test Reaction in Typhus.—Mante relates that repeated application of the intradermal tuberculin test to 109 typhus patients showed that a positive reaction during the febrile phase was a favorable sign; all the patients thus responding recovered. The reaction veered to positive during convalescence much more rapidly in the mild than in the graver cases. The curve of the reaction is thus closely connected with the general condition and affords a basis for the prognosis.—D. Mante, *Presse Medicale, 26, 50 (1918)., Jour. A. M. A. 70, 1042 (1918).*

(*A. L.*)

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Prophylactic Value of Agglutination in Cholera.—Negroni's research has confirmed the value of agglutination tests for distinguishing the true cholera germs from those that resemble them. No agglutination was ever noted with the pseudocholera germs in dilution beyond 1:500 and very rarely up to this, while with true cholera germs it occurs at 1:10,000 and even at 1:100,000. The agglutination at 1:100,000 is complete in four hours with the living germs, but with germs killed with phenol it occurs in four hours only with dilutions of 1:1,000; seven hours, 1:20,000, and fourteen hours with 1:50,000.—P. Negroni, *Bolletino dell 'Istituto Sieroterapico, 1, 75 (1917); Jour. A. M. A. 70, 1043 (1918).*

(*A. L.*)

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Germ Content of Milk as Influenced by the Factors at the Barn.—This is a continuation of studies on the bacterial contamination of milk, originally started at the New York Agricultural Experiment Station and now being carried on in coöperation by the New York and the Illinois stations. The authors of the present bulletin have made tests of the germ content of the milk produced in three quite dissimilar barns at the Illinois Station where sterile pails were furnished to the milkers and the analyses made from samples taken from the pails immediately after milking was completed. The conclusion reached is that "even under wide extremes in barn conditions it is possible to produce milk with a germ content of less than 10,000 bacteria per cc. when the utensils are properly prepared."—M. J. Prucha and H. M. Weeter, *Univ. Ill. Agric. Exper. Sta. Bull. No. 199, 23 (1917); Abst. Bact. 1, 522 (1918).* (*A. L.*)

Comparison of the Rate of Gas-Production by Certain Bacteria in Raw and Pasteurized Milk.—The author concludes that "pasteurization causes milk to become more favorable to the attack of the gas-forming bacillus and *B. aerogenes.* These results seem to reinforce the impression long held by many milk men that pure raw milk has a power of resisting changes which the same milk does not possess when pasteurized. Between raw and pasteurized milk there may be important differences, although chemical analyses may show no appreciable differences. It should be more generally recognized that pasteurized milk instead of receiving less care than raw milk should receive greater care because of its lessened resistance to many detrimental changes which the appearance of the milk does not indicate. This is especially significant in that, in general, pasteurization has lengthened the period between production and consumption."—Paul W. Allen, *Jour. Inf. Dis. 21, 219 (1917); Abst. Bact. 1, 524 (1918).*

(*A. L.*)

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A Case of Ropy Milk Due to Bacterium Aerogenes.—The milk from the dairy in question appeared perfectly normal when fresh but after ten to twelve hours it became ropy and finally a mucilaginous mass. Bacteriological tests showed that the condition was due to contamination by *B. aerogenes* which gained access to the milk from the water, fodder, etc.—G. Dalla Torre, *Ann. d. r. Stazione Sper. d. Caseificio di Lodi, 1916, p. 23; Abst. Bact. 1, 525 (1918).*

(*A. L.*)

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The Contamination of Milk by Feces: Experiments in Italy.—Comparative experiments showing the total number of bacteria and of coli-aerogenes organisms in the feces of the cow and the pig. The feces of the pig yielded much higher counts. Data are presented showing the rapid growth of the organisms in milk.—G. Dalla Torre, *Ann. d. r. Stazione Sper. di Caseificio di Lodi, 1916, p. 15; Abst. Bact. 1, 526 (1918).* (*A. L.*)

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A New "Specific" for Malaria.—A number of remarkable cures reported from the use of a remedy invented by the author sixteen years ago. The mixture consisted at first of the raw juice of a certain species of lemon, a quantity of crude biborate of sodium, and the sulphate, phosphate, and chloride of calcium. The later addition of iron and antimony (vinum) gave still more staisfactory results. The new mixture was used in every type of malaria; in hyperpyrexia it was found to act as a diaphoretic and quickly broke the temperature permanently even in those cases that had no splenic enlargement.—H. Willis, *Indian M. Gaz., Clacutta. 52, 230 (1917); Abst. Bact. 1, 537 (1918).*

(*A. L.*)

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The Disinfection of Drinking Water.—A disinfectant in tablet form consisting of p-sulphondichloraminobenzoic acid with sodium carbonate has been found highly efficient for the sterilization of contaminated drinking water. Directions for the preparation of the germicide and of the tablets are given. Tablets, one of which is suitable for the sterilization of a quart of reasonably heavy contaminated water may be prepared at the rate of about 200 for one cent. The tablets dissolve in about ten minutes. Action is completed in from fifteen to thirty minutes. A convenient working name of Halazone has been applied to these tablets.—H. D. Dakin and E. K. Dunham, *Brit. Med. Jour. No. 2943, 682 (1917); Abst. Bact. 1, 540 (1918).*

(*A. L.*)

⁂

A Simple Means of Ascertaining if a Sterilizing Hut is Hot Enough to Destroy Lice and Nits in Clothing or Blankets.—Wax of a suitable melting point in dishes of definite surface area is used.—A. Bacot, *Brit. Med. Jour. No. 2953, 151 (1917); Abst. Bact. 1, 544 (1918).* (*A. L.*)

⁂

Colorimetric Determination of Reaction of Bacteriologic Mediums and Other Fluids.—The method described has been devised to accomplish a fairly accurate determination of hydrogen ion concentration without the necessity of preparing standard solutions or of depending on those prepared by others. The authors are concerned only with reactions lying between 7.0 and 8.0, and only phenolsulphonephthalein has been used as an indicator. Other indicators and other ranges of acidity will be investigated later.—G. D. Barnett and H. S. Chapman, *Jour. A. M. A. 70, 1062 (1918).* (*A. L.*)

Bacteriology of Ozena.—A summary of the authors' study of 100 cases shows that the group of organisms known as the *B. mucosus-capsulatus* (Friedländer's bacillus, Abel's bacillus) is preponderant and may be pathognomonic in cases of chronic rhinitis. This group is also independent of the action of putrefactive bacteria. In cases in which the symptom of malodor exists, a different class of bacilli known as the Perez group is most abundant and all cases show either one or both of the Perez and proteus groups present as causative factors of this condition. Cases of chronic catarrh may harbor pathogenic organisms of other species such as the diphtheria bacilli and contribute to the distribution of similar infections.—H. C. Ward and D. C. Beaver, *Jour, Lab. Clin. Med. 3, 348 (1918); Jour. A. M. A. 70, 1122 (1918).* (*A. L.*)

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Nature of Rabies Virus.—Remlinger calls attention to the diffusibility of rabies virus as a special property which distinguishes it from protozoa and bacteria, and brings it closer to chemicals. For instance, if tissues containing the bacilli of anthrax, tuberculosis or glanders are immersed in glycerin, they do not diffuse through the glycerin, and the latter can be injected into susceptible animals without inducing infection. But if any tissue from an animal with rabies is placed in glycerin, the glycerin and even scraps of normal tissue that have been immersed in it, likewise, promptly induce rabies in animals inoculated with the glycerin or the scraps of tissue in it. This extreme diffusibility is like that of chemical substances.

The rabies virus differs however from chemical substances in that it passes through the more porous filters but not the others. With a less porous filter, the virus may induce rabies in the animal inoculated, but it is impossible to reproduce the disease from this animal in others. With a still finer filter, the virus induces merely cachexia without actual rabies. Chemical substances in solution, on the other hand, pass through the filters regardless of the porosity. The rabies virus therefore, in regard to the filters, behaves differently from both bacteria and chemicals.

The rabies virus behaves paradoxically also in centrifugation. This has no effect on a chemical solution, but it does have a very slight effect on rabies virus; the virus very slowly leaves the upper layers of the fluid. In short, the rabies virus, filterable and diffusible, seems to offer a connecting link between the visible microbes, which represent the lower limit of the vegetable kingdom, and the diastases, that is, the colloidal substances which may be regarded as at the highest limit of the inorganic bodies. It is thus a transitional form between the visible microbes and the colloids.—P. Remlinger, *Bull. de l'Académie de Med., Paris, 79, 137 (1918;) Jour. A. M. A. 70, 1123 (1918).* (*A. L.*)

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Action of Cold on Microörganisms.—It is generally accepted that cold inhibits the proliferation of germs but does not destroy them. Ruata's experiences, however, have demonstrated that a long enough exposure to cold will destroy the cultures beyond possibility of recuperation. The temperature was dry cold and kept constantly between—3 C. and—12 C. Thirty cultures of colon bacilli and other germs were placed in the refrigerator and some were withdrawn on successive days and incubated. By the fourth day only from three to forty-nine colonies developed, instead of the thousands of the second day, and no colonies at all developed after the fourth day. Similar results were obtained even with four strains of bacilli and one streptococcus isolated from putrid meat. The conflicting results that have been obtained by others were probably due to the fact that the contact with the cold was not long enough to have its action penetrate through the entire mass. Even one germ still living in the center of the mass would start a culture. But systematic permeation of the entire mass by cold of these degrees will certainly progressively sterilize it in time.—A. Q. Ruata, *Annali d'Igiene, Rome, 28, No. 1 (1918); Jour. A. M. A. 70, 1125 (1918).* (*A. L.*)

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Occupational Diseases and Industrial Hygiene.

Abstracts prepared by Drs. E. R. Hayhurst, R. P. Albaugh and P. M. Holmes.

Health Insurance.—This 75-page quarterly constitutes "a positive statement in answer to opponents" with a supplemental bibliography upon the subject of health insurance for the industrial workers of America. Three official investigating commissions—in California, Massachusetts and New Jersey—have so far reported on the question, and each of them favorably. Five or six additional states are now making similar studies. "Our citizens," declares the New Jersey Commission, "are confronted with an urgent call for the employment of their energies upon the field of battle and in the supporting industries. We are told that the work of at least five persons in the industries is needed to maintain one man in the trenches. Many thousands, unaccustomed to peculiar occupational dangers, are entering industry for the first time. . . . The United States government has wisely provided for its enlisted soldiers and sailors the most liberal systems of disability insurance and family allowances ever offered for such a purpose by any nation. The individual states should be no less considerate of their army of industrial workers." The sickness problem, the possible methods of meeting it, of applying the insurance principle, and the scope, benefits and cost of health insurance are carefully gone into. The weekly average per capita cost is placed at 53 cents, to be divided between employers, workers and the state, as estimated by the California Commission. For this a surprising list of benefits may be provided.—*Review, Amer. Assn. for Labor Legislation, Vol. VII. No. 4.*

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Anthrax.—*Monthly Review, U. S. B. of L. S.,* Dec., 1917, p. 254, abstracts Jackson and Buswell's article on the "Disinfection of Tannery Wastes," in which the authors were requested to investigate the subject of infection of meadows by the waste from a tannery. Investigation showed anthrax at times in the factory effluent. The authors finally perfected an installation for disinfecting the effluent. (See *Jour. Amer. Leather Chem. Assn.,* June, 1917, pp. 229, 253.)

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Dermatitis Due to Moa Wood.—*The Monthly Review, U. S. B. of L. S.,* Dec., 1917, p. 204, abstracts an article from the Berlin *Vorwärts* describing an itching eruption breaking out on the arms and other parts of the body of three workmen who were working on this Australian wood species which is sometimes used in luxurious passenger steamers. Hospital treatment of the workers required three weeks. A crystalline alkaloid was found to be the real cause of the disease.

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Protection of Health of Munition Workers in Italy.—The Italians appear to have gone minutely into this subject in the three pamphlets which Dr. Hamilton translated. They appear to be possessed by a peculiar fear of hurting the feelings of either the employer or employee in some of their rulings. For instance, the doctor must maintain secrecy as to the industrial sickness he discovers; even in making out his report to the local committee he must only indicate symptoms without stating his diagnosis, although the case may be entirely evident. While he may instruct the worker in prophylaxis against disease, he is forbidden to advise him against entering these dangerous trades. A list of industrial diseases which must be reported is given but the physician may indicate only acute cases of poisoning. There are, however, many excellent provisions such as reducing the number of persons engaged in manual work as much as possible, the providing of work clothes, refectories, printing of instructions, etc. The Italians have also seen the wasteful effects of their hurry earlier in the war and are now increasing their efforts to provide adequate protection to workers.—Alice Hamilton, *Monthly Rev., U. S. B. of L. S.*, Jan., 1918, pp. 184–194.

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"Chronic Lead Poisoning" a Reliable Diagnosis.—It is to be noted that the committee appointed by the Vital Statistics Section of the American Public Health Association recommends that "Chronic Lead Poisoning" be regarded as reliable, without autopsy, if there appears a statement of an occupation in which decedent would be subject to lead poisoning, or if the source of the poisoning is specified and complications accompanying, sufficient to cause death, are described. This is the statement under heading 57 of "General Diseases" in the comments made on the International List of Causes of Death. In a like manner other "Chronic Occupation Poisonings" may be regarded as reliable, without autopsy, in cases where the occupation or source of poison is specified, etc.—The Accuracy of Certified Causes of Death, *U. S. P. H. Reports*, Reprint No. 440, 1917.

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Pleurisy an Occupational Disease of Farm Workers.—Braillon, in *Paris Médicale*, calls attention to the characteristic location of a pleural effusion in the front upper part of the pleura in men who bend over at their work, such as tillers of the soil.—Abstracted by *Jour. A. M. A.*, March 16, 1918, p. 817.

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Tin Poisoning.—A man who had a plate of teeth set in tin or rather Watt's metal, two-thirds tin and one-third bismuth, complained continually and for over a year of a feeling of coldness, indefinite pains in his arms, legs and head and of soreness in his throat. He was put down as a neurasthenic until eventually a blood and urine examination showed tin as did also the stools. The literature shows that in animal experiments tin has a predilection for the nervous system with frequent paralysis of the limbs. Although the plate was discarded, the symptoms persisted and the conclusion is that his nervous system was in some way permanently damaged by the metal. He still complains of his "hots and colds," although he is now able to attend to business..*—Moses Salzer. *Jour. A. M. A.*,

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New York Academy of Medicine Adopts Resolutions on Occupational Diseases.—According to the news columns of the *J. A. M. A.* (April 6, 1918, p. 1018), the New York City Academy of Medicine on March 7, 1918, adopted resolutions urging upon medical schools the necessity of instruction in the treatment and prevention of occupational diseases, particularly with reference to the poisonous substances used in war and other industries. The medical press was also requested to give more space to the subject and the federal government requested to coöperate through its corps of public health service experts.

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* By a goodly number of hygienists the question of any specific toxicity of tin has been much in doubt. The metal is so rarely used by itself that, in industrial workers at least, other metallic poisons, especially lead, are diffictlt to rule out.—E. R. H.

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THE MEDICAL OFFICERS TRAINING CAMP.*

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THIS camp was established by order of the War Department, in June, 1917, the work to continue with successive classes as long as might be necessary. The present commandant, Col. William N. Bispham, Medical Corps, U. S. Army, organized the camp and has been constantly at its head from the start. To him is due the credit for the efficient manner in which it has been conducted and the excellent results obtained. The following paragraph from the above mentioned order states the purpose of the camp:

"The proposed training is intended to reach all the untrained medical officers now in, or hereafter to enter the service, and give them reasonable insight into their new functions, and into those of their subordinates, with the least possible delay. The officers so trained must be able not only to perform their own duties efficiently without supervision of more experienced officers, but also to act as efficient instructors of their subordinates, both commissioned and enlisted."

The mere statement of the number of student medical officers and enlisted men of the Medical Department who have been trained here, together with a list of the various medical units into which they have been organized suffices to show clearly the work done.

Since the opening of the camp about 3,000 physicians from all parts of the United States have been taught the many and varied duties of the medical man in the army, and more than 10,000 enlisted recruits have been drilled, trained and organized into the following medical units, the officers for these same units being furnished from the student officers of the various classes.

The medical units organized have been as follows:

Ten Ambulance Companies.
Eleven Field Hospitals.
Two Evacuation Ambulance Companies.

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* Published by permission of the Surgeon-General

Eight Evacuation Hospitals.
Eight Hospital Trains.
Four Sanitary Detachments.
One Veterinary Corps.
One Band.

The course of training for the student medical officers is of three months' duration, and represents over 540 hours of actual work in field and classroom exercises. A wide range of subjects is covered by means of drills, rides, lectures, recitations and demonstrations, and by assignments to various organizations for short periods of actual duty. The object always in view being to give the new medical officer a practical working knowledge of the duties he will later be required to perform.

The new arrival is immediately assigned to a student officers company, where he lives under the strict routine of the soldier, being required to attend all formations and in every way to conform to military discipline, in order that he may himself become familiar with it and thus the better be capable of maintaining proper and just discipline over those officers and enlisted men he may later command.

Not the least important result of the course to the medical officer, and to the service as well, is his greatly improved physical condition, due to more regular habits, more regular hours, more regular meals of plain, wholesome food; and the many hours spent in the open in drills, rides and map making.

It is not the purpose of this article to describe, or even to enumerate all of the various subjects taught during the three months, however it may be that mention of a few of the more important should be made. It is, of course, essential that the new man should be instructed in the fundamental principles laid down in *Army Regulations*, the Manual for the Medical Department, the Field Service Regulations, the Manual for Courts-Martial and the Drill Regulations and Service Manual for Sanitary Troops, in order that he may become familiar with those rules which define his relations to the service and to the individuals in it. He must be taught how to draw and to read maps, and must be made familiar with the paper work of the medical department, and to this end the various blank forms are explained to him and he is required to prepare complete sets for himself.

Considerable time is devoted to the internal administration of ambulance companies, field and evacuation hospitals, base and general hospitals. Many lectures and demonstrations are given upon special subjects, such as war surgery, orthopedic surgery, roentgenology and psychiatry.

One of the most important subjects in the entire course is that of Military Hygiene and Sanitation which is covered in twenty hours of classroom work, eight hours devoted to outside demonstrations at the Field Laboratory of Experimental Sanitation and two hours to the making of actual sanitary inspections about the camp. This ends the course for the majority, but those officers who are found to be best qualified to perform sanitary work are detailed to duty at Camp Funston, at first simply accompanying the sanitary inspectors on their daily rounds, but later actually becoming assistant sanitary inspectors themselves.

Here they are doing actual camp sanitary work, but under the eye of experienced men, who guide them and give them suggestions when necessary, but who encourage them to depend as much as possible upon themselves. These details to duty at Camp Funston are not made for any definite length of time, but if a man proves to be competent, he usually continues at this duty until a call comes in from some division, when he is assigned as sanitary inspector.

The classroom instruction in sanitation covers, by means of lectures, recitations and examinations, the subjects of the general duties of sanitary officers, their relations to line organizations, the responsibility of the medical officer in the training of the recruit, personal hygiene of the soldier, including his feeding, clothing and housing. Under housing is discussed the permanent and temporary barracks and the various types of tents in use, as well as the heating, lighting, ventilating and general care of each.

As the two prime requisites of the soldier are to be able to march and to fight, considerable attention is given to the duty of the medical officer in connection with the care of marching troops. The personal hygiene of the soldier on the march is discussed, and also the sanitary precautions to be observed both for the protection of the troops and for the protection of the inhabitants of the community through which they are passing.

Particular attention is given to the procuring of safe drinking water for the men, and also to the manner in which water shall be used during the march. The rates at which the different organizations march, the distances usually covered in a day, the methods employed for handling the sick on the march are all taken up and described in detail. The wheeled kitchen is first described in the classroom and then the type in use in the United States Army is actually exhibited and explained in detail, particular attention being called to its application to trench warfare whereby the troops may be provided with warm meals—something which would otherwise be impossible. Special stress is laid upon the sanitary points to be considered in the selection of camp sites, following which comes the subject of camp sanitation to which several days are allotted, covering water, fuel and food supply, garbage disposal, latrines, picket lines, disposal of horse manure, camp police, dumps, incinerators, soakage pits, fly prevention, bathing and laundry facilities and methods of disease prevention.

The special sanitary measures to be applied where troops are billeted in a friendly country are outlined, as are also those dealing with trench warfare, battlefield sanitation and the disposal of the dead. The more common camp diseases are discussed in some detail, comparisons being made between those of former wars and those of the present war in Europe and a brief but concise outline is given of the manner in which each is transmitted and of the proper preventive measures necessary.

Concurrent and terminal disinfection and terminal fumigation are described and indications for their use mentioned. A brief description of the habits and life histories of those insects capable of transmitting disease, together with the methods best adapted to their destruction and prevention, forms the last subject considered.

The indoor part of the instruction being completed, the class is divided into sections to receive their instruction at the Field Laboratory, where they see actual working models of some sixty different sanitary appliances for camp use. These include not only those devices which have been long in use in our own and foreign armies, but also new inventions which are being tested to determine whether or not they have any qualities which justify their use in the field. One new device has attracted not a little comment, and will doubtless be brought into general use in the near future and therefore it will be mentioned at some length. The disposal of garbage in military camps has always been a more or less troublesome problem and, in Europe, where all kinds of fuel is scarce, it becomes a matter for serious consideration.

In an endeavor to devise an incinerator for garbage which would use a minimum quantity of fuel, and therefore be particularly adapted to meet the above problem, Maj. Charles S. Williamson, M. R. C., of the Department of Military Hygiene and Sanitation, has brought out an apparatus which has surpassed all expectations.

Due to the kindness of Major Williamson, I shall briefly describe it in this article. A full, technical description of the incinerator, by the inventor himself, will appear in another publication.

This incinerator consists of a brick stack or chimney twelve feet in height, the internal measurements being four and one-half by six feet.

At the base of the stack there is a fire grate made of iron pipes, and at regular intervals above horizontal shelves are arranged alternately from front to back. The lower shelf covers but half the horizontal surface area of the inside of the stack, while the other five are wider and cover all but the space of a foot on the longer side. These shelves, when in place, are arranged like baffle plates in a tank, and the tank being then stood up on one end. They can be made out of old boiler plate, if not too thick, their supports being of wrought iron or steel, as the heat which they are required to withstand is intense. Old wagon tires straightened and bolted together answer well for this purpose.

All iron-work is so arranged as to be readily removable, the work of removing it requiring but half an hour, so that it is not at all difficult to make repairs, if any of the parts burn out.

To operate the incinerator, first put a load of garbage on the top shelf, then push that down from shelf to shelf until it reaches the lower shelf, and then repeat the process until the incinerator is full. At the start only one or two inches of garbage should be placed upon a shelf, but later after the shelves and the walls have become thoroughly heated the depth may be about four inches.

A brisk fire is then started upon the grate—and it has been determined that about two hundred pounds of wood is necessary in order to insure a good start. As soon as the garbage on the lower shelf dries and begins to burn it is pushed down into the fire on the grate, where it acts as fuel with which to dry and burn the garbage from the shelf above. As soon as the lower shelf is cleared of its load the contents of each shelf is pushed down to the shelf below, and a fresh load is placed upon the top shelf. Observation shows that the garbage can be pushed down one shelf about every two to three minutes. After the garbage begins to burn and to be carried down into the grate no more fuel is required, no matter whether the quantity to be burned be large or small. Wood is only required at the start. An incinerator of this size burned, at a recent test, 16,000 pounds of garbage in four hours and fifty-five minutes and, on another occasion, when no effort was made to crowd it burned 19,013 pounds in eleven hours and twenty-three minutes. In each trial two hundred pounds of wood was used in starting, and none thereafter.

This incinerator is one which can be built in a short time, at almost any place; the materials are not expensive, and the work can be done by anyone who can lay brick. It is extremely economical of fuel. It can easily handle the garbage of a division, and it would seem to be the logical type to build at all large camps which are to be maintained for a month or more.

The possibility of adapting this type of incinerator to the needs of small cities should be considered. The initial cost for materials and labor in construction is so small that it could be easily met by even the poorest municipality, the fuel expense would be nothing, as enough refuse would always be at hand for that purpose, and the only item to be met would, therefore be that for labor.

The making of sanitary inspections of various organizations in the camp closes the class instruction in sanitation, after which those who have been selected for this branch of work are assigned to duty at Camp Funston, as above described.

Throughout the entire course an effort is made to keep strictly to the practical side of the work, few theories are discussed, and the student is required to learn details of only those appliances which have been proven to be of definite value.

In this paper I have purposely described only the special training given to those student officers who are to make the subject of sanitation their particular line of work after they are assigned out to regular duty with troops, but it is to be understood that there are many other special courses which prepare student officers for work in other special lines, such as orthopedics, roentgenology and hospital work, both medical and surgical. In fact there are many post graduate courses which are available for those who are qualified to take them, and an effort is made to get the new medical officer into the work which he is best qualified from previous experience to fill.

The results obtained indicate that the camp has fulfilled the purpose for which it was established.

RURAL HEALTH ADMINISTRATION UNDER THE CO-OPERATIVE OR LOCAL HEALTH DISTRICT PLAN.

GUSTAV F. RUEDIGER, M. D.,
Former Health Commissioner for LaSalle, Peru and Oglesby, Ill.

Read before the Public Health Administration Section, October 17, 1917, at Washington, D. C.

I WISH to preface my paper by saying that the Committee on Rural Health Administration has come to an agreement that the phrase "Rural Health Administration" shall refer to health administration in purely rural settlements and small urban communities with a population less than 30,000.

Great progress has been made during the last twenty-five to thirty years in public health practice and sanitation but as yet most of the advances made have found practical application only in our larger centers of population. Here we have expert vital statisticians, epidemiologists, bacteriologists, diagnosticians for obscure cases, milk and dairy inspectors, medical school inspectors and a corps of public health nurses, all of whom are working toward one common goal—prevention of sickness. It is very different, however, in the smaller cities, villages and rural communities. There are but few cities with less than 30,000 inhabitants, and probably none with less than 15,000 that have even a full-time health officer, to say nothing about a bacteriologist, milk and dairy inspector and school nurses or other school inspectors. This, I believe, is due primarily to lack of funds, and this latter condition is due to the fact that our unit for establishing a more or less independent health department is too small. We cannot expect cities with a population from 2,000 to 10,000 to engage a full-time health officer, public health nurses, a bacteriologist and a milk and dairy inspector because the expense of maintaining such a staff is too great for such a small community. Moreover, if a way were found to finance such a health department the public health work required to be done would not keep the staff busy over half of the time, and there would, therefore, be a useless waste of money.

Most of these difficulties can be entirely overcome by coöperation of neighboring towns, villages, and cities under 30,000 inhabitants. If two or more towns, including all incorporated villages and cities therein, get together on the matter of public health administration and create a public health district (said district in most instances to have a population of at least 20,000 to 25,000 people) then a fairly good revenue can be got for the support of an efficient and properly organized health department and the work will be sufficient to keep a small staff busy all of the time. The area must have some kind of a political organization with a governing body which may be called a board of health, or a board of trustees. This board must have power to raise funds for the support of the work, either by special tax or otherwise, appoint a health officer and remove him for just cause, and with his advice and consent appoint such public health nurses and other assistants as are necessary. The chief health officer should be the executive officer of the board and upon him, and not on the board, must be placed the responsibility of enforcing all local and state health regulations of the district.

During the last two years five different states have passed laws authorizing the organization of local health districts by coöperation of neighboring towns, villages, and cities. In Illinois a petition signed by at least 5 per cent of the voters of the district must be presented to the county clerk, who then has a special ballot prepared for the next regular election and the question is submitted to a vote of the people. If a majority in each town vote for the proposition the district is organized and the supervisor from each town, together with the chairman of the county board or supervisor, is the board of health. The board has some legislative authority, has power to levy a special tax not to exceed four mills on the dollar, may receive donations, and shall appoint the chief health officer from a list of eligibles prepared by the State Department of Health by a competitive examination.

The health officer is the executive officer of the board of health and it is his duty to enforce and observe the rules, regulations, and orders of the State Department of Public Health and all state laws pertaining to the preservation of the health of the people within the public health district. He is further charged with the duty of executing and enforcing within his district all city, village and incorporated town ordinances relating to nuisances, public health and sanitation. He exercises the rights, powers and duties of all township boards of health and county boards of health within his district and has the power to investigate the existence of any contagious or infectious diseases and adopt measures to arrest the progress of the same; and to make all necessary sanitary and health investigations and inspections within the district. He must devote his entire time to his official duties and the salary which is fixed by the board of health must be at least $1,500 a year.

The Massachusetts law permits two or more neighboring towns to form a joint committee composed of the chairman and secretary of the board of health of each of the towns, and this committee may appoint a health officer to act for the entire district.

Under the New York law the state health commissioner is empowered to create a local health district on the request of the town board of any town and the board of trustees of any village and the common council or other like authority of any city. The board of health for the district consists of the supervisor of each town, the president of the board of trustees of each village and the mayor of each city included in the district. All town, village and city boards of health within the district are abolished upon the formation of the consolidated health district, and their powers and duties are conferred upon the board of health of the district.

In California a local health district may be created by the board of supervisors of the county in which the proposed district is situated, upon the presentation of a petition signed by at least 10 per cent of the voters of the district. There is a board of trustees consisting of one member from each unit of unincorporated territory, appointed by the board of supervisors, and one from each incorporated city or town, appointed by the local governing body thereof. The board is given all necessary powers and is authorized a levy a special tax not to exceed two and one half mills on the dollar.

The Michigan law permits the erection of local health districts by the union of neighboring townships and villages, but it appears that incorporated cities may not be included. A petition of not less than 15 per cent of the qualified voters is presented to the village or township board, who then place the question before the people at a general or special election. If a majority of all votes cast in each township and village to be included within the health district is in favor of erecting the health district, the same is then declared to be created by the county board of supervisors. Each township board and each village board elects one member to act on the district board of health. The district board of health is given the necessary authority to carry on public health work and appoint a health officer, and is required to submit to the township board, annually, an estimate of the amount necessary to carry on the work of the district health department.

The minimum requirement for a coöperative health department that is to serve a number of small communities depends somewhat upon the size of the population and the area of the district to be served. In districts with a small population, ranging from 15,000 to 20,000, it may not be possible to get more than a full-time health officer and a school nurse. There should, however, be a fairly well equipped office with a desk, filing cabinets, telephone and the necessary record cards and other stationery, and a properly equipped bacteriological laboratory, because in such a small department the health officer must do the necessary bacteriological work and serve as milk inspector. In some cases it may be necessary for him to do something with dairy inspection and it would, therefore, be necessary for the department to make some kind of provision for transportation. In districts having a population of 30,000 to 50,000 there should be a chief health officer, an epidemiologist in charge of contagious diseases and the bacteriological laboratory, a sanitary inspector, several school nurses (at least one for every 2,000 school children), a stenographer and office attendant and at least a part-time dairy inspector. The expense of maintaining such a department runs from $12,000 to $15,000 a year, or from 30 cents to 40 cents per capita and can in most cases be raised by a three mill tax.

As far as I am aware there are but two coöperative health departments in operation in this country. One of these is at Wellesley, Needham, Weston, Framingham and Belmont, Mass., and was put in operation in 1913 through the efforts of some of the members of the teaching staff of the Massachusetts Institute of Technology. The other is at LaSalle, Peru and Oglesby, Ill., and was organized in the fall and winter of 1913–14 by a gentlemen's agreement between the mayors and city councils on the one hand and a public spirited citizen on the other, who agreed to furnish the necessary funds, provided that the cities would accept the services of the department when put in charge of properly trained men, and give them their moral support. The cities at present pay nothing toward maintaining the department except the salaries of two sanitary officers, one for LaSalle and one for Peru, and they agreed to provide for garbage collection. Our staff consists of a chief health officer, an assistant health officer on part time in each of the three municipalities, a bacteriologist, a laboratory helper and janitor, three school nurses, one infant welfare nurse, a part-time dairy inspector and the two sanitary officers just referred to. The expense of maintaining the department is approximately $17,000 a year, and we serve about 30,000 people.

LaSalle, Peru and Oglesby, Ill., are three small manufacturing cities with 12,500, 8,900 and 4,600 inhabitants, respectively. They are located in LaSalle and Peru townships, which have a joint area of thirty-six square miles. The entire district is thickly settled as there are several settlements of one hundred or more families just outside the city limits. LaSalle and Peru adjoin one another and Oglesby is four and one-half miles south of LaSalle, across the Illinois River. The population is made up chiefly of foreign laborers who are employed in two zinc refining plants, three cement mills, a number of coal mines, a wheel and plow factory, a clock factory and several smaller industries. The population of the entire district numbers approximately 32,000.

Before the establishment of the coöperative health department these communities had no more in the way of machinery for public health administration than most other small cities of that size. Each of the three municipalities had a part-time health officer, two of whom were paid $25 a month and the other $35. With such small remuneration not much service could be expected and of course nothing was done in the line of milk and dairy inspection, medical inspection of school children, epidemiological investigations and collection of morbidity and mortality statistics. Quarantine regulations were very lax and were constantly being violated and not infrequently smallpox patients were walking the streets without apparent restrictions. Diphtheria patients were nearly always released from quarantine as soon as the membrane had disappeared, often within one week from the time of onset, or whenever the attending physician told the health officer to release the case. No cultures were taken either for diagnosis or for release. Scarlet fever patients were quarantined only from two to three weeks and were not seen by the health officer before being released. As a consequence epidemics of diphtheria, scarlet fever and smallpox were of frequent occurrence.

With the inauguration of the coöperative health department most of these conditions were radically changed. Practically all diphtheria cases are diagnosed culturally and none are released from quarantine until two negative cultures from both throat and nose have been obtained by the health officer or the assistant health officer, on two consecutive days. Scarlet fever patients are quarantined for a minimum of five weeks but are not released until inspected by a medical officer from the health department. Epidemiological data are collected on practically every case of diphtheria, scarlet fever, smallpox, typhoid fever and acute anterior poliomyelitis, and instructions are given in regard to the care and disposal of bodily discharges.

LaSalle had a milk inspection ordinance but nothing was done under it except to make a butter fat test once a month on samples that often were brought in by the dealers on request. We, therefore, had a uniform milk and dairy inspection ordinance passed in the three cities and now all dairies are inspected and scored every three months by a veterinarian, and samples of milk are collected from every dealer twice each month for bacteria counts and for the determination of butter fat and solids. Nearly all milk is now delivered in steam-sterilized bottles and approximately two thirds of it is pasteurized, whereas formerly most of the milk was dipped from cans on the wagons and, of course, was not pasteurized. All dairy cows were tuberculin tested and all reactors have been disposed of from those herds whose yield is not pasteurized. About once each month samples are collected from each producer when he delivers it at the bottling station and if the tests are not satisfactory the matter is talked over with him in an endeavor to get an improvement.

All grocery stores, meat markets and restaurants are inspected and scored every three months and recommendations made for improvements. A vigorous campaign was instituted three years ago against the outdoor privy nuisance and has resulted in the abolishment of two hundred and fifteen of the three hundred and eighty-eight nuisances of this character that were found in an area of one hundred and eight blocks right in the heart of LaSalle. Two prosecutions had to be instituted and were successfully carried through in order to get this result, but the work is not yet completed.

The school children in both public and parochial schools are given a careful passing inspection at the opening of each school term, three times a year. All schools are visited at least twice every week by one of the nurses for the purpose of finding cases of contagious diseases. All cases of sore throat are cultured and sent home to await the results of the culture, or to await further developments if scarlet fever is suspected. Whenever diphtheria breaks out in a room cultures from both throat and nose are taken of every pupil and the room dismissed until the results of the culture can be learned, and the desks and doors can be washed off with a disinfectant. Absentee visits are made in the homes whenever there is a suspicion that the child is ill, and in this manner nearly half of the cases of contagious diseases among school children are found before they had been reported.

Physical examinations are made of all school children in the second, fourth and sixth grades each year so that each child is examined every other year. Records are kept of all examinations and the parents notified of all defects which appear to the inspector to be serious enough to require dental, medical or surgical treatment. These cases are followed up by the nurses to interest the parents in the child's ailment and get treatment. Last year about 55 per cent of the cases of defective vision received attention; 20 per cent of those who were recommended for treatment of the tonsils were operated on (57 out of 275) and 26.9 per cent of those recommended for dental treatment received such attention (511 out of 1,900); 214 of the latter received their dental treatment at the free dental clinic which was established just a year ago, and is operated in connection with the central office and laboratory building of the health department. The dentist is paid for his time but puts in only two half days a week. The school nurses are charged with the duty of bringing enough children each half day to keep the dentist occupied every minute for which he is paid.

One nurse devotes all of her time to infant welfare work and prenatal instruction and is doing excellent work. With a total of six hundred and nineteen births reported last year we had recorded fifty-five deaths of infants under one year of age, giving us an infant mortality rate of 8.88 per hundred births. Through a plan of coöperation with the local anti-tuberculosis society, one of the nurses is devoting half of her time to anti-tuberculosis work and receives half of her salary from that society. The remaining half of her time is given to school work in Oglesby.

A small, but first class, fire-proof isolation hospital is in process of construction, and will be finished within three months. It will accommodate about twenty patients when finished and costs approximately $42,000, completely equipped, and is a gift to the community.

The death-rate for the entire district last year was 12.63 per thousand and the year before 13.19. There were twelve deaths from the acute communicable diseases, diphtheria and scarlet fever, in the entire district, whereas the year before there were sixteen and three years ago forty-seven.

*

Medical Secretaries.—Simmons College announces the graduation in May and June of specially trained women to serve as secretaries in hospitals and dispensaries, or to private physicians. Their training includes all the technical secretarial work and in addition a knowedge of medical terms, scientifice German and general and special science as applied in the diagnostic laboratory.

RURAL HEALTH ADMINISTRATION UNDER THE STATE HEALTH DISTRICT PLAN.

DR. FREDERICK W. SEARS,
Sanitary Supervisor, State Department of Health, Albany, N. Y.

Read before the Public Health Administration Section, October 17, 1917, at Washington, D. C.

IN SO short a paper, I will not take the time to go into details of the organization of the New York State Department of Health, as constituted by the Laws enacted in 1913, but will confine my remarks principally to certain features of its operation which have most impressed me in my experience of three and one-half years, both as a state sanitary supervisor and as a health officer of a second-class city. I will say, however, that I believe no one who has observed its workings and the results of the present system by our chief, Doctor Herman M. Biggs, would be willing to adopt at the present time, any other system.

The placing of the responsibility of administration in the hands of a single individual, who is given full authority of enforcing its regulations and provisions, is along the line that makes for efficiency in all great enterprises.

Quick decisions and prompt action in conditions of extreme urgency, can only be obtained under such a plan.

As essential as are advisory boards in assisting in the formation of suitable regulations regarding the activity of various departments and separate units of the system, the best results have not been attained when such boards have assumed the executive function. Under the New York State system, the Public Health Council, of which the state health commissioner is a member *ex-officio*, has been given the authority to formulate regulations for the guidance in matters of public health; such regulations, having the force of law without the necessity of being submitted to the state legislature, have demonstrated the wisdom of such a plan.

It requires no argument to convince this body that a public health council, which is selected from men eminent for their attainments in the various fields of public health work and of which the chief executive is a member, is more capable of fixing the minimum requirements for public health administration, than is a legislative body to which few physicians aspire, and fewer are elected, and that few rarely, if ever, selected for their knowledge of sanitary science.

Many physicians of the highest attainments along other lines are too frequently sadly lacking in their knowledge of public health work. Legislative enactments are too slow in their development, and often too cumbersome in their interpretation to meet the needs of a science which must be elastic in its adaptation and extremely progressive in its application.

The frequent meeting of the Public Health Council enables that body to be ever ready to meet emergencies, and to modify existing regulations as is necessary to meet ever changing conditions. This body, fixing as it does the minimum requirements in the ordinary public health administration, such as the control of communicable diseases, the regulation of the production and sale of milk and its products, the defining of nuisances and the methods for their abatement and many other important regulations, does not interfere with progressive communities going beyond these requirements, but does prohibit them from making less stringent rules, thus giving to the state certain standards of uniformity.

Furthermore, the placing of competent men at the heads of the various divisions who are able to concentrate their energies in that one direction, and who are always at the command of the chief executive of the State Department, is a most essential provision.

Public health work is too comprehensive to expect any one man to work out the details of the management of all of its various branches, including as it does laboratory research, vital statistics, communicable diseases, child hygiene, sanitary engineering, etc.

Yet, as essential as are the functions of all this central administrative body, its efficiency would be greatly restricted were it not for the field force represented by the district sanitary supervisors and diagnosticians who are in constant touch with this central body on the one hand, and with the local health officers of the ultimate districts on the other hand.

We will not stop to compare all results with other methods, and to give the details of the operating of such a system, but shall confine ourselves largely to the effect of this system upon the local health units, as represented by the health officer and the local boards of health.

Much has been written of late on the advisability of establishing full time county health officers by legislative enactment, and wiping out the local health units, as they now exist. I am not in favor of such a plan. I am convinced that the inefficiency in the rural health unit administration in the past has been due to the old village system, or I might say, of entire lack of system. Under the old plan, the local health officer was confronted with almost complete isolation from the central body, and, in a great proportion of instances, by the indifference of the local board of health which rarely ever met to consider health matters, or to offer him any encouragement. This, with the constant rebellion of some of the members of the community, whose so called personal liberties he was required to restrain, in enforcing the health regulations, and with this, a disinclination to allow him any compensation unless an epidemic of some disease occurred in the community. As one member of the local board expressed to me, he saw "no reason why a health officer should be paid when there was nothing to do," implying that there was nothing to do, except when an epidemic did occur. Under such an environment, the most sturdy heart loses its enthusiasm and incentive. The effect has been that the health officer has been blamed for conditions which under other circumstances would not have existed.

I have been long convinced that health administration does not meet its highest attainments through police methods of enforcement, but rather through education and coöperation of all the local forces which he can bring to his command. The local physician in most communities is a highly respected citizen to whom many go for advice, not confined to medical subjects, and under proper guidance and assistance the local health officer becomes a powerful factor in securing the educational and coöperative methods needed. I believe it would be wrong to eliminate by legislative enactments this vital force.

The district sanitary supervisor, if at all tactful and diplomatic, can familiarize himself with the needs of each one in his district. To bring about this desired coöperation, the sanitary supervisor, if necessary, may assume for the health officer the responsibility of enforcing a needed regulation upon some rebellious family, or it may be upon a favored patient whom he does not wish to offend. The sanitary supervisor should be ever ready to give advice in the application of the various Code Regulations, as prescribed by the state commissioner, and also by meeting the district boards of health to explain to them the need of greater activities in the prevention of disease. We must teach these boards of health that the function of the health officer is not primarily to fight epidemics, but to prevent their visitation upon the community.

In the writer's experience, local epidemics, except possibly those which are caused by water or milk infection, are not of sudden development, but are developed not unlike some diseases which may become generalized from neglecting to care for the primary invasion. They are largely due to the development of disease carriers, the result of neglecting to manage the advent of isolated cases; thus showing indifference to their presence until such foci have beome so numerous and so widely distributed, that all that is required for the disease to assume epidemic form is to bring those various localized carriers in proximity to those who are susceptible to that disease, as for instance in schools, Sunday schools, and other public gatherings.

The system of rigorous school inspection at the beginning of the school year in search of these carriers is one of the very best methods of preventing epidemics.

Under the present district system, I believe the time is not far distant when epidemics of communicable diseases, if not a thing of the past, will be of extremely rare occurrence.

By the prompt reporting of all communicable diseases to the State Department, either by card or by telegram or telephone, in the more urgent situations, the sanitary supervisor, who is in constant touch with the heads of the various departments, can be immediately notified, and prompt action taken.

By tabulating all of these diseases and sending them to the sanitary supervisor in weekly charts, a system of spot maps can be made which will acquaint him at a glance with the condition in his various units, and their relations one to another. To my mind, one of the greatest achievements of the present administration is the improved Vital Statistics Record, the more uniform regulation in the production and distribution of milk, and the lowering of infant mortality throughout the state.

One of the most progressive steps recently taken by the public health council, and the one which is to gradually eliminate politics from public health activities and to bring about the attainment of full time health officers, is to the writer's mind the establishing by that council the qualifications necessary for the appointment of local health officers, and the requiring of all local health boards to select the health officers from those whose names have been certified as meeting these qualifications. To this end, the State Department has prescribed certain courses of instruction which, in its judgment, will best fit the health officers for their duties.

By this method the efficient, interested health officers are stimulated to greater activities, and their field of work is gradually extended by the elimination of the inefficient and indifferent health officers, until the desired result is obtained.

By this process of evolution, we will bring each local community to a higher view of the value of the health officer in the prevention of disease, and will have secured the coöperation not only of his local board but of the members of his community as well. This method, to the writer's mind, is superior to the proposed legislative methods referred to, which prevent coöperation by the production of a feeling of resentment so often met with in rural communities, by what they term unnecessary interference with conditions which should be met locally.

In January, 1916, it was the writer's great privilege to receive permission from the State Public Health Council to put into operation, in connection with Syracuse University, a course of study for local health officers which he had suggested to that council as in his judgment best meeting the requirements of his district. This course of instruction consists of four months' reading and of twelve weeks' part reading, with two days a week devoted to residence work in Syracuse, in practical instruction and demonstration.

This course was started in February, 1916, and so far we have conducted four classes of an average number of twenty for each class. Certificates have been granted to the members of these classes after they have passed a written examination. About seventy-five acting local health officers have earned these certificates. Of necessity, on account of having to meet two days a week, the radius over which such a course can be extended is limited on account of the sacrifices in time and money that is expended in traveling long distances each week, and in order to meet this situation other similar units will be necessary in other parts of the state. Two other unit systems have recently been started, one in Albany and one in Buffalo.

The effect of these courses has been highly gratifying. The local health officer has been stimulated to higher activity and incentive, and in many instances has gradually extended his activities, and in nearly all instances has secured the coöperation of the local boards of health and of the various organizations in his local community.

The health officer has thus become an active agent in securing better equipment and greater facilities for the combating of disease. In many localities the local boards have shaken off their previous indifference, and have become interested to the extent of paying the entire expense of their health officers who have taken these courses, and, in at least one instance, of purchasing the text-books for his immediate use.

As an illustration, in one small town in my district a health officer had, under the old system, become perfectly indifferent to all public health work. He took the prescribed course in Syracuse about a year ago, and at the present time is the health officer of three towns and is also acting health officer in a neighboring village, and is doing good and efficient work.

It is expected that by this method the time is not far distant when there will be a great diminution in the number of health units throughout the state, a condition already quite marked, and that we will have brought about the larger district system by having stimulated local communities to greater assistance along these lines, through educational methods.

In many instances the health officer has already secured the coöperation of the various local organizations, such as the local Grange, the various Women's Auxiliaries, Labor Unions, and other active bodies.

It is self evident that to carry on such a comprehensive system as is now in effect in New York State, sufficient appropriation must be made by the legislature to make it effective, and inasmuch as the legislators are governed chiefly by the public sentiment of their local constituents, this will result as a natural consequence, and is, I believe, being brought about in New York State in a very satisfactory manner.

It has in former times been a reflection upon our legislative bodies that they have, as for instance, devoted 23 per cent or more of the entire budget of the state for the maintenance and care of the insane, and have at the same session appropriated 1 per cent or less not only for the prevention of insanity but for all public health activities combined.

For the details showing what has been accomplished in the nearly four years in which this system has been in force in New York State, I must refer you to the records of the department, but in conclusion I will say that we believe they are most gratifying as administered under our present leader, who has the faculty of maintaining such a splendid *esprit de corps* and efficient service throughout the entire organization.

HEALTH PUBLICITY AN AID TO COÖPERATION BETWEEN HEALTH DEPARTMENT AND CITIZEN.

John W. Trask, M.D.,
Washington, D. C.

Read before the Public Health Administration Section, Washington, D. C., October 18, 1917.

THE work of the health department has for its purpose the maintenance of the physical well-being of the community. There are available to the department three principal fields of action.

General sanitary projects can be installed, such as a safe water supply and an adequate sewerage system Measures can be carried out, such as the regulation and control of milk production, handling and sale, the disposal of stable refuse and materials in which the larvæ of flies develop, and the drainage or other treatment of accumulations of water in which disease-carrying mosquitoes breed. These give an important element of protection to the entire population and while they can be carried out without particular coöperation on the part of individuals, the support and endorsement of the community are essential.

Then there are other measures more personal in their application, such as the control of foci of communicable diseases and the regulation of industrial conditions and of housing. These require to a considerable degree the intelligent coöperation of the individuals concerned.

Finally, there is the broad field of personal hygiene which depends practically entirely upon the knowledge possessed by the individual and upon his habits of life. The health department is powerless in this field except through its influence as a teacher of hygiene.

All measures for the protection of the health of the population depend primarily upon the citizen's desire to maintain the physical well-being of himself and family and his understanding to a degree the means by which this can be accomplished. Even the installation of such a project as a proper water supply depends under a democratic form of government upon the desire of the community to have such a supply and its willingness to be taxed to meet the necessary cost. The extent and results of communal health activities are essentially the product of the sanitary and hygienic sense and desires of the citizens of the community. Progress in communal hygiene and sanitation therefore depends upon the education of the citizen in matters pertaining to community and personal hygiene. The real question at present is not whether attention should be given to education, but how the education can be best accomplished. The matter is one which, because of its underlying importance, merits the most careful consideration.

Instruction of the people in the principles of hygiene and sanitation is instruction in how to live successfully and is fully as important as instruction in reading, writing, and arithmetic.

The dissemination of information on matters relating to hygiene is not strictly administrative health work. In a way it is nothing but education of the most important and practical kind. The time and place best adapted to the teaching of these things would seem to be childhood and the school. The child has a receptive mind, while the adult is likely to have erroneous ideas which are replaced with difficulty. The adult is not readily taught. Instruction in hygiene and sanitation should certainly be begun in the grammar grades at school. This could be supplemented by regular courses given in the high schools by representatives of the health departments properly qualified to give such courses. Furthermore, a college curriculum without a good course in the principles of hygiene and sanitation should be a curiosity and the subject of criticism. Every medical school might well give a good course in hygiene. One might even expect every medical school to give as thorough a course in what we are accustomed to term "preventive medicine" as it does in anatomy or the practice of medicine or surgery. The physician has greater and broader opportunities of using a knowledge of hygiene and sanitation than has the lawyer or engineer and he should be better informed on the subject. The program being inaugurated in New York State providing for physical training and health education in the public schools is a most important step forward.

Family magazines and educational periodicals could increase their usefulness by maintaining well edited departments for the discussion of matters relating to personal and community hygiene. In newspapers the health column might well be as indispensable as the joke column.

Up to this point we have been discussing the wider dissemination among the people of knowledge of matters relating to sanitation and hygiene, the education of the citizen in personal and community hygiene. This may not be considered as administrative health work. It probably is not. There is, however, a kind of educational work, better called publicity, which is strictly a part of administrative health work. Reference is made to the kind of publicity which keeps the community informed as to what the health department is doing and the duties and responsibilities of the citizen in relation to the work of the health department. This publicity is essential to and is a part of successful administrative health work.

There is no surer way to get the support and coöperation of the people than by keeping them informed as to just what the health department is doing and what it is attempting to accomplish. Keeping the public informed as to what the health department is doing, what it is attempting to accomplish, and why, has an educational effect, arouses an interest in the health department and gains for it the intelligent support of the community.

The proper function of the health department is of such importance to the welfare of the individual and the family that one may properly expect all but the most stupid and ignorant to be vitally interested in it. This relationship between the community and the health office is only occasionally found. What is the reason—are the health departments at fault, or are the people blind to their own welfare? Is the health department really an unimportant part of the community government, or is it merely that the average individual cannot see its importance? Probably in many instances the health department is at fault and sometimes the people are blind. In many instances the health department as organized and run is an important factor in the community government. In other instances it is not. The conditions are likely to constitute a vicious circle. The community provides poorly for health protection and the poorly equipped and inadequately trained health department gives poor service.

It is interesting to consider in what connection the average citizen thinks of the health department. Is it not too frequently in connection with bad smells, leaky plumbing, the neighbor's chicken coop, or some other fancied nuisances apparent to the senses? The citizen thinks of the health department in connection with these so-called nuisances because these are the things with which health departments in many places have identified themselves in the past.

During the last decade health agencies have wisely spent much effort in educational propaganda of various kinds. Frequently the main effort has been devoted to sanitary education and little attention has been given to publicity of the actual work being done. There are many happy exceptions to this, however.

All efficient health departments now use spot maps for the purpose of showing graphically to the department staff the distribution of communicable diseases, of surface wells, of privies, and other health factors capable of such graphic representation. The citizen has almost as great an interest in the whereabouts of cases of communicable diseases in a community and of conditions menacing health as has the department staff. This is especially so of households with children. People may be told the way in which typhoid spreads. They may even know that there is a case in the next block. But all this makes little impression. One seldom sees many cases of a disease and is therefore not impressed. The spot map in a way lets the observer see all the cases of typhoid fever in the community at a glance. It shows him where they are and how grouped. It will show the number and distribution of surface wells and cesspools. Maps tell a story that it is impossible to tell by word of mouth or printed page.

The Weather Bureau carries its message largely by the weather maps. It makes a continuous exhibit by the use of kiosks in cities and bulletin boards elsewhere. The health department might also reach the people by disease maps and sanitary maps of various kinds. It can create an interest and impart useful information by means of the spot map. It might display maps in public places—maps showing the distribution of typhoid fever, of diphtheria, of infantile paralysis, of surface wells, and cesspools—maps that could be changed daily or weekly, or at less frequent intervals, depending upon the material concerned. There are several processes by which such maps could be reproduced. They might be published in newspapers and in department bulletins.

It is believed that such a practice, if followed, would effectively spread information regarding existing conditions because it tells its story at a glance without the effort or expenditure of time required in reading a printed statement. Greater use can be made of this means of education than is made at present. The world is so flooded with printed matter that few find time to read any except the things pertaining to already developed interests. Maps are of such a nature that they carry conviction. They tell their story without the expenditure of time or effort and impart information most likely to arouse an interest in health matters—an interest in that side of health work shown with difficulty otherwise than by maps. They cause the community to associate the health department with its real work, disease prevention. The use of maps is mentioned merely as an illustration of the part graphic methods may play in giving publicity to concrete things relating to the actual work of health departments.

No health department can be really successful without the intelligent support and backing of the community. Publicity regarding its actual work is an essential factor in gaining such support and backing. The facts are that the average community in the aggregate is neither stupid nor indifferent to its welfare as regards health protection. And where health departments do not gain the adequate support of the people it is undoubtedly because either they do not merit it or they do not make use of the right kind of publicity.

Food
KEEP it COMING
"We must not only feed our Soldiers at the front but the millions of women & children behind our lines"
Gen. John J. Pershing
WASTE NOTHING
UNITED STATES FOOD ADMINISTRATION

The Spirit of '18.
The World Cry-
Food!
Cultivate the Soil.

MOSQUITO CONTROL IN NEW JERSEY.

Ralph H. Hunt, *Major, M. R. C.*

Read before the Sanitary Engineering Section, American Public Health Association, Washington, D. C., October 18, 1917.

ONE scarcely needs to give a reason for attacking the mosquito problem in New Jersey.

The literature from early colonial times down to recent years is filled with references calling attention to the baneful influence of the mosquito. Not only has it rendered the lives of citizens intolerable at certain seasons of the year, but it has hindered industrial development and depreciated property values computed by millions.

Thousands of acres of good arable land lie fallow because of the presence of this pest. Many places, attractive otherwise for human habitation or industrial purposes, are rendered unhabitable. Men and beasts of burden are unable to live in comfort and perform their labors.

The work of mosquito control was sporadic until 1912, when the present County Commission Law was placed on the Statute Books. This law gave a non-partisan personnel, and an appropriation based upon ratables. It made the giving of the funds mandatory upon the County Boards of Freeholders, after the budget had been approved by the director of the State Experiment Station.

The county unit was adopted because it seemed to offer a large enough unit for effective work. When one is dealing with a pest the range of flight of which varies from a few hundred yards to forty miles, the reason for a large unit is evident. If any change were to be made we all feel that the unit should be made larger. For example, the Newark Bay Marsh, containing twenty-nine thousand acres of salt meadows, lies within five adjoining counties, each capable of feeding a brood of mosquitoes into the other. It is easy to understand that if one of these counties fails in its work the beneficial effects of conscientious work in the adjoining counties would be more or less nullified. Our own opinion is that more effective work could be done were the whole area in question placed under one responsible head. There are many reasons why this has not been done up to the present time, but it must come in the near future.

It is a cardinal principle of the fight against any pest that there must be as perfect a knowledge as possible of the habits and life history of the insects in question and the effects of environment upon it. Many questions have been answered in regard to the breeding places, effects of temperature, salinity of the water, the effect of pollution with sewage, the range of flight, of the different species, the life history of the larvæ and adult forms, also the effect of natural enemies.

We will first take up the salt marsh varieties—Aedes Cantator, and Aedes Sollicitans. These breed in the brackish waters of the salt marsh. These mosquitoes are the ones which have given New Jersey its reputation as the Mosquito State. Formerly they appeared in vast clouds. Their range of flight has been determined with a maximum of forty miles, and an average flight of ten to twelve miles. They travel easily against a light wind. It is our experience that after breeding they immediately seek the upland. They do not enter houses, as a rule, and are not troublesome in the day unless disturbed. Between the hours of six in the afternoon and nine at night they are most active. It is these mosquitoes which are so troublesome out of doors, on the farms, in the garden, on the verandahs, and golf courses.

Their range of flight is easily determined, as we have only to ascertain the distance of the nearest salt marsh to the point of capture. These marshes are intersected by tidal creeks. After many years of investigation and experiment we have come to the conclusion that with a system of dikes, tide gates, and ditches these meadows can best be controlled. This method in effect shuts out the tide and gives drainage to the water coming down from the upland. In our county we have dug 1,800,000 feet of ditches, have built eight miles of dikes, and have installed as many tide gates as are necessary to control the tidal water.

There are many difficulties to overcome in such work, but we believe this to be the proper method for controlling the salt marsh. Of Nature's aids in the salt marsh work we have the ever present Killie fish. It does not do to exclude their aid nor to rely too much upon it. It is also found necessary to establish a circulatory system behind the dikes to prevent stagnation of the water. Many times we find breeding in these ditches but this difficulty is being overcome by the above method and temporarily by oiling.

The eggs of these varieties are viable in the mud for several years so that a meadow safe one year without reinfection may give trouble in later years.

The degree of salinity of the water seems to be the determining point in the particular species which is present. Aedes Cantator breeds in a slightly saline water while Aedes Sollicitans on the other hand requires a high degree. This is borne out in our findings on the marsh. Those parts of the marsh bordering the upland and far removed from the salt water give us the Cantator, while those sections of meadow with easy and short access to it give us the Sollicitans. This point has a practical value in the methods of control.

The next important variety is the Culex Pipiens or Fatigens—the house mosquito. This is a general breeder requiring fresh water but otherwise it is not particular. It breeds in brooks, rain barrels, catch basins, tannery vats, roof gutters, open pools, on the top of piled up beer barrels, and, in fact, almost anywhere. One of its favorable breeding places is water contaminated with sewerage.

Formerly it was thought that this mosquito had a very short range of flight. By means of collections on the wing we have several times traced the flight of this mosquito in large broods for a distance of six miles.

Another fact ascertained is that this variety will breed in waters on the salt marsh near the upland of a low degree of salinity, if it be contaminated with sewerage. Until this fact was ascertained we were unable to control the pests of Pipiens in our county.

Both in Hudson and Essex counties raw sewerage is allowed to pollute the salt marsh near the upland.

In detail the method of determining the flight of this mosquito is as follows. Inspectors are placed in the early evening along lines running in different directions and the point of intensity is determined by the number of mosquitoes taken. The intensity increases as you approach the point of origin and thins out in all other directions.

Next in frequency we have to deal with the woodland and swamp varieties—Aedes Sylvestris and Canadensis. They are the most difficult to control. During the present year an unusual flight of Sylvestris occurred. It was traced, as in the case of Pipiens, by collections on the wing and its greatest point of nuisance extended for ten miles.

It has long been a belief of the writer that when local conditions are fairly well cared for; a severe infestation of mosquitoes always indicates a large area of breeding probably located at a distance. In dealing with severe infestations of mosquitoes it is our belief that preventative work must be done at a distance from the point of nuisance commensurate with the flight of the infesting mosquito.

As to the cost of the work for the past year our appropriation was $60,000 for the county of Essex. Our population is approximately 600,000 and the per capita cost .0916 cents. The cost per square mile was $417.50.

As to results: the Pipiens or house mosquito is under control in the country. The salt marsh varieties are a pest only at times of very heavy rainfalls and high tides of several days duration. The woodland and swamp mosquitoes are at times troublesome and are a problem yet to be solved.

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The Fundamental Requirements of Energy for Proper Nutrition.—"The *basal metabolism* is the amount of heat, as measured in calories, which is produced by an individual lying in bed completely relaxed, at which time the oxidative activities are at their lowest ebb." When a man stands upright or sits in a chair his *basal metabolism* is increased 10 per cent. A soldier walking at the rate of three miles an hour requires an additional 1.1 calories to move a pound of his body through this distance each hour. The extra calories per hour attributable to occupations of men are: Tailor 44, bookbinder 81, shoemaker 90, metal filer and hammerer 141, painter of furniture 145, carpenter making a table 164, stonemason chiseling tombstone 300, man sawing wood 378. The *basal metabolism* of women is: 37 calories per hour per square meter of body surface, or 93 per cent of that of men, measured by the same standard. Here again is added 10 per cent for standing or sitting during a period of sixteen hours a day. To this result is added the extra calories per hour according to the occupations of women (table omitted). Under-nutrition reduces the basal requirement of energy which may largely economize food, but to accomplish a given amount of work a fixed amount of food-fuel is required, irrespective of the nutritive condition of the body. "It may become necessary for Americans to 'train down hard' as people in the warring nations of Europe are forced to do, and it is important to realize that this may be done without detriment to health."—Graham Lusk, *J. A. M. A.*, March 23, 1918, pp. 821–824.

THE SANITATION OF SWIMMING POOLS—PRELIMINARY SURVEY OF LOCAL CONDITIONS.

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and
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SWIMMING pools are steadily increasing in favor throughout the whole country but knowledge of their sanitation has not been spread with equal rapidity. Although this growing popularity leads to increased interest in sanitary conditions which prevail in the pools, yet those most interested, in many instances, have never given much attention to practical control. Possibly this is because of the seeming incongruity on first thought of hygienic dangers lurking in institutions so hygienically approved as a swimming pool.

The bath houses of ancient Rome contained pools which could accommodate hundreds. They fell into disfavor, however, but whether due to the possibility of the spread of disease through their use, or the supposed effeminacy resulting from the relaxation of a hot bath, or the immorality connected with them, is not settled. Pools were in use at various times from then on, according to various historians. In 1846 the Bath and Wash House Act in England gave rise to the various public baths and public swimming pools in that country. The fast increasing number in the United States are probably an outgrowth of that legislation. We find, in addition to public swimming pools and bath houses, plunges in almost every club, college, Y. M. C. A. or like institution in the country. They are also being installed in hotels, schools, private homes, ocean steamboats and, in fact, any place where people congregate. In many places the authorities are considering making compulsory the use of pools and the learning of swimming. This will make a serious duty of their sanitary supervision and doubtless result in holding those authorities responsible for any transmission of disease which may result from their use.

No purpose of establishing municipal control of the conduction of swimming pools was in our minds when the present study was undertaken in St. Paul, although we realized that eventually such municipal supervision would be necessary, and agree with Lyster (Jour. Am. Med. Assoc., 12–10–11) that tanks should be under local supervision of the health officer just as much as ventilation of buildings. In St. Paul the swimming pools exclusive of those in private residences now number seven, and in the past few years scattered samples of water collected in various ways and at various depths have been brought to our laboratories by those most interested. The results of their examinations were so varied, and so at variance with what we were led to expect, that we determined upon a thorough and systematic routine examination of all which we could reach, to present a survey of conditions as they now exist.

Available literature has been consulted freely to establish some sanitary standard as a basis for our work but without success. It is only during the last ten years that there has been any attempt towards the sanitary control of swimming pools and while articles have been written on the sanitation of them, they have been infrequent. The methods of examination described show a lack of uniformity and no standard has been established of purity although the ideal of one similar to that for drinking water has been suggested.

We have reviewed the literature somewhat thoroughly here with an idea of bringing the subject to public discussion as a provocation of increased study of some of the necessary sanitary factors of preventive medicine.

That bathing in polluted waters may actually spread disease has been shown by Aiken (Proc. Ill. Water Supply Assoc., 1911) who has probably definitely settled the controversy which had existed on that point. As a result of his statements many cities situated on polluted rivers have closed bathing beaches which they had on them or have replaced them with shower baths, obtaining their water from other sources or filtering and treating the more accessible river water before its use.

The forms of disease most easily transmitted by polluted water admit of classification most readily into three groups: intestinal, eye and ear, and venereal.

Intestinal.—Jager and Drescher have reported epidemics of proteus infection from bathing in infected waters at Ulmer on the Danube, and on the Neisse. Many other writers have reported enteric fever from bathing in polluted waters. Shiga reports an outbreak of 413 cases of dysentary which he concludes were due to the ingestion of river water by bathers, and others have advanced presumptive evidence that intestinal disease can result from bathing in polluted waters.

Eye and ear.—Eye infection among patrons of a public swimming pool is reported by Fehr. Trachoma has been reported spread in this way by Schultz. Cobb reports such transmission of ear infection.

Venereal Disease. — Gonorrhea, spread through the direct medium of a swimming pool, is reported at Posen by Skutch. Bending reports a less epidemic at a brine bath. That Bacillus prodigiosus can pass from the water into the vagina of women swimming has been demonstrated by Hertzka and Sticker.

Skin infections while not classified by Aiken are reported locally, as are nose and throat infections.

By far the most important diseases transmitted by swimming pools are those which affect the intestinal canal. The venereal group come next. The most important factor in the spread of disease is the presence of organisms and the determination of the number of organisms present is the index of safety to the pool. Particularly important is it to determine the presence of intestinal bacteria such as Bacillus coli, typhosus, etc. We believe chemical analysis of pool water to be valueless in sanitary significance, as the organic matter added by each swimmer makes such analysis difficult of interpretation. In this regard pool water analysis differs from drinking water analysis.

The especial points considered in our survey were (1) Bacteriological Control, (2) Management of the Water, (3) Chemical Disinfection, (4) Construction and Equipment, (5) Administration, and (6) Cost. All the pools were supplied by city water and as St. Paul is blessed with an excellent water supply the factor of attention to the source of water was not considered. Literature shows the following views on these factors:

(2) MANAGEMENT OF THE WATER.

Refilling.—Earlier writers considered refilling very important. Mannheimer has recently shown (Am. Phy. Ed. Rev., 1912, 17, p. 669) that there is no direct relationship between the number of weekly refillings and the sanitary condition of the water in a swimming pool.

Dilution is considered an expensive and efficient means of improving the sanitary condition of swimming pool water. (Mannheimer, ibid.)

Refiltration.—Angel concludes that this means improves the general appearance of the water, and also lowers the bacterial content of swimming pool water. It also reduces cost of maintenance.

(3) CHEMICAL DISINFECTION.

Copper sulphate. The excellent results obtained in the destruction of bacteria and algæ in drinking water by the use of this substance have led to its use for the same purpose in swimming pool sanitation. Stokes seems to be credited with the first use of the chemical for this purpose in 1905. Recently Levine (Jour. Infect. Dis., March, 1916) has again demonstrated its efficiency. Thomas (Jour. Am. Med. Assoc., 9–25–15) says that .04 parts of copper sulphate per million of water used every day will keep a pool in sanitary condition. Others advocate larger amounts. The formula given by Thomas to determine the amount of copper sulphate to be used is based on .5 parts per million, which seems nearer the accepted standard.

The effects on the human economy of repeated small doses of copper sulphate is not thoroughly understood. The toxicity of blue vitriol in concentrated form is well known, however, and its use unless properly understood and carefully supervised should be deplored.

Calcium Hypochlorite, which is also spoken of as bleach or chlorinated lime, has long been used in purifying water for drinking purposes. In the last few years a dozen authors have advocated its use for swimming pools. The efficacy of this chemical depends on the liberation of free chlorine which is the germicide. The commercial preparations lack in stability and frequent tests must be made to determine the available chlorine. This ordinarily varies from 24 to 33 per cent according to sample. Tully (Am.

Jour. Pub. Health, March, 1912) recommends .5 parts hypochlorite per million of water, chlorine 30 per cent available. Others believe it necessary to use as high as 3 parts per million to sterilize a pool. The chemical is costly, at present the price is very high, so much so in fact that filtering plants in some cities find it cheaper to use tanks of liquid chlorine and chlorinating apparatus rather than add solutions of bleach to the water. Chlorine has also the disadvantage of being irritating to mucous membranes and consequently is unpleasant to patrons of the plunge. The hardness of the water also governs the amount of bleach to use. This is a simple chemical proposition as if there is a chemical combination of the chlorine, it is not available as a germicide. We are still at work to determine the correct amount of hypochlorite to use to obtain the best results in disinfection of pools supplied with local city water. We are also carrying on parallel experiments with copper sulphate.

(4) CONSTRUCTION AND EQUIPMENT.

No architectural literature was consulted and no especial detailed study was made of construction. From a sanitary viewpoint the chief factors are: smoothness of lining, lack of obstruction to the water, surface overflow and life rail in combination, adequate shower and toilet facilities, large enough filtration plant, and laundry adjacent.

(5) ADMINISTRATION.

Mannheimer has found that the administration of the pool, inspection of bathers before entering the pool, and their instruction in swimming pool sanitation were the most important agencies in keeping the bacterial counts low.

(6) COST.

This factor naturally enters to a certain extent in suggestions to correct conditions found, but should not be determinative as cost should not be allowed to endanger health. The aim should be to secure a sanitary pool at the lowest consistent cost.

In collecting samples we used a Rotschka rod of a special design and glass stoppered tincture bottles of 100 cc. capacity. Usual sterilization of the glassware was followed. In all instances the samples obtained were plated within one-half hour after their collection.

Although it has been stated that the samples from different parts of the pool vary very little in bacterial content, we collected samples in almost every instance from the top and bottom, shallow and deep ends of the pool for comparison and study. We avoided surface or bottom contamination by collecting about twelve inches above or below the actual bottom or top. It was interesting to note the difference in counts where the pools were idle and how quickly a few bathers stirred the entire tank to uniformity of count.

The methods of analysis we followed were those recommended by the Committee for Standard Methods of Water Analysis of the American Public Health Association. We determined the counts on plain agar; the number of acid colonies (gas formers) on litmus lactose agar, incubated forty-eight hours; and presumptive for Bacillus coli in lactose bile fermentation tubes. We have examined the water for filling as it came from the city taps in every case as a control. Where possible we ascertained the actual number of bathers. Any interesting or unusual factor was noted. Over 150 samples were examined from the seven pools and two beaches, and supervision maintained from April until November.

Our report has been made as full as possible although in many instances desired data have not been obtainable. In some instances we did not find eager coöperation from those who had charge of the pools and in other cases we were forced to disbelieve statements of control which the supervisors made to us. The effort has been made to present a survey of swimming places in this city exactly as they exist as a basis for further studies in their sanitary control, as we recognize the incompleteness of this preliminary report.

For lack of space the itemized tabulations are omitted.

LOCAL SUMMARY.

The larger pools include three associational pools, one college pool and one charity. The smaller ones are in connection with bath and barber shops, the two beaches are well known.

The larger pools are well supervised and the various managements are anxious to do all in their power to maintain pools of the highest degree of purity. They are handicapped by not being able to secure help of very great intelligence nor those who appreciate the importance of the sanitary duties assigned to them. In every instance better supervision of preliminary shower would be beneficial for the sanitary condition of the pools. In almost every instance the capacity of the filters is not sufficient to refilter the water in the pool once during the day time. This would seem a grave defect. All these pools practice disinfection but where hypochlorite is used it is not checked up for available chlorine nor is there any check of the results derived from its use. Copper sulphate is used in two instances but here too the results are not known.

One pool of 56,250 gallons should be mentioned particularly. With the coöperation of the management, the water was used seventy-five days. There were 3,565 bathers. The first six days nothing was done to control the sanitary situation. The count rose rapidly and fermentation occurred with .1 cc. The filters were then started and run continuously for six days. At first the count improved markedly; then, as the filters became so dirty that frequent reversal was not sufficient to cleanse them, the count rose again. Next, copper sulphate was used after 5,000 gallons dilution. The count did not improve in six days. The filters were next run ten hours every day and copper sulphate added alternate days The count improved to normal for this pool and remained so. After a month of this régime, the engineer who had charge of the pool went on a vacation, leaving a substitute in his place. The count promptly rose and stayed up till the vacation was over. At the end of the time mentioned, the water still had a pool-normal count through filtration and chemicalization but was changed anyhow.

The bath house pools are used only as a plunge after a Turkish bath. The very nature of things makes them more used in the winter than in the summer. Every person who uses one of these pools has had a full and thorough bath with soap, hot water and plenty of friction. The skin bacteria should have been very largely eliminated in this way. These pools should practice disinfection, as the size of the pools does not justify installation of refiltration plants.

The two beaches examined showed results exactly opposite. The one on the river was highly polluted and showed very marked evidence of intestinal contamination, even .1 cc. The lake beach was about the same as city water—extremely low count.

The conditions of the pools in this city do not differ materially from those found in other cities, although they do not compare favorably with many reports in literature. The evidences of contamination with intestinal bacteria are frequent where certain classes of people use the pools. The comparison of the figures for local swimming pool conditions compare very unfavorably with those of the city water which should be the standard here. More time and attention should be given to sterilization of the pools.

GENERAL CONCLUSIONS.

Construction.—Pools should be built with a smooth lining, offering as little obstruction to the flow of water as possible. Four sides of the pool should be available for use in every instance. A drip basin should be situated about twelve inches below the main platform to catch the drip from bathers standing before diving. Life rails should be about four sides. An overflow gutter should also be arranged the same. Splendid combination drip basin, life rail, overflow gutters are frequently seen. Where possible pools should be at the top of the building in which they are contained. The problem of lighting is thereby easily solved (and it is imperative that a submerged person should be always easily seen for perfectly obvious reasons), further, the water from the pool can be readily used when the pool is on the upper floors, for flushing closets, urinals, etc., throughout the rest of the building, the water of dilution replacing that withdrawn for the purposes mentioned. The saving of the cost of water by this location of the pool should more than offset the added cost of stronger construction and extra plumbing.

Where a drip basin is installed the pool platform may slope toward the pool for drainage, otherwise it should slope away.

Strict attention should be given the cleansing of the pool when it is emptied. It should be thoroughly scrubbed, scraped, and then flushed. Careful steaming of the walls and finally, airing and drying would help materially in reducing the bacterial content of the next filling. Where wreaths of sediment collect on the floor of the pool during use, various ways have been devised for its removal. Pumps on the general plan of a vacuum cleaner are recommended. Where refiltration is practiced the water being constantly in motion should prevent the formation of these wreaths.

Water.—The same attention should be given to the water for filling purposes as is given to drinking water. The purest water obtainable should be chosen rather than the most accessible.

Management of the Water.—Constant *refiltration* makes it possible to use a given filling a greater length of time. This is an important item in cost of maintenance and will more than compensate for the initial cost of the equipment. The tendency toward installing a plant of too small capacity should be avoided. It should be possible to refilter all the water in the tank in one day (eight hour days are vogue). Usual frequent attention should be given to reversal of filters, washing and steaming. *Dilution* should be practiced sufficient to make up the loss by splashing, etc. No definite amount can be stated. This should depend on the number of bathers, frequency of refilling, etc. As a rough working rule it is suggested that the dilution be sufficient to amount to one filling between refillings. *Refillings* should be determined by the number of bathers, size of pool and bacterial content, as there is no direct relationship between the number of weekly refillings and the sanitary condition of water. The general appearance of the water counts for nothing.

Chemical disinfection is imperative. Both calcium hypochlorite and copper sulphate have advantages—the latter probably being the favorite. Either should be used in strengths increasing from .5 part to the million of water depending on the size of the pool, number of bathers, the hardness of the water and the bacterial reduction obtained. Bleach must be tested frequently for available chlorine. It quickly disappears from the pool.

Supervision of Bathers.—Full shower bath with soap should be demanded of all bathers. To make this possible the shower apparatus must be inspected very frequently. Instruction should be given bathers in the purpose of the bath. Especial attention should be given the peroneal region. When water strikes a person's body, the natural tendency is to urinate. This should occur in the shower, not in the pool. The floor should be taken care of to prevent tracking the dirt, bacteria, etc., which have been washed off by the shower, onto the deck about the pool. On the pool platform inspection of every entrant should be performed. Bathers should wear no clothes. If this be impracticable the authorities of the pool should furnish the suits—one-piece, undyed, scanty,—and see that they are properly sterilized and dried between usings.

Municipal Control.—If necessary, every pool—charging a fee for entrance or free—should be licensed by the local health officer. Inspection and bacteriological examinations should be frequent, and failure to come up to a certain standard should be cause for revoking a license. In this the method of control would somewhat resemble that of milk. If the use of swimming pools be made compulsory the authorities who so make them should be held strictly accountable for the sanitary conditions in the pools and the spread of disease through them.

STANDARDS FOR THE PREVENTION OF COMPRESSED AIR ILLNESS.

Seward Erdman, M. D., F. A. C. S.,
New York City.

Read before the Industrial Hygiene Section, A. P. H. A., Oct. 17, 1917, at Washington, D. C.

A "STANDARD BILL for the Prevention of Compressed Air Illness" has been very carefully prepared by the American Association for Labor Legislation, and this bill was adopted without change in New Jersey in 1914.

It is almost identical in many of its provisions with the New York State bill which was passed in 1909, the rates and times of decompression for both tunnel workers and caisson workers is the same in all three bills above alluded to.

However, the New Jersey bill provides for shorter hours of labor than the New York bill, and accordingly provides a still greater margin of safety for the air workers, in thus reducing the length of exposure to high pressures which is one of the vital factors in the causation of the disease.

The provisions of the "Standard Bill" adopted in New Jersey, are thoroughly endorsed by the writer, in so far as they concern the general duties of employers, equipment for work in compressed air, suspension of caissons, inspection, medical attendants and nurses, hospital lock, the employment of certain persons prohibited, physical examinations, record of physical examinations, hours of labor, and the provisions for the enforcement of the law.

In addition to these requirements, we would advocate the following:

1. That all tunnels and caissons be provided with telephone allowing instant communication with the compressor plant.

2. That the hospital lock be furnished with a glass port, permitting observation of the patient from without, by the medical attendant.

3. That no person over forty years of age, who has not previously worked in compressed air, shall be allowed to commence work under pressures above 20 pounds.

4. No person, whose weight in relation to height and age exceeds the standard tables in common use by life insurance companies, shall be permitted to commence work in compressed air. (Fat men are very poor air risks.)

5. No alcoholic beverages shall be allowed on the premises.

6. That hot coffee be furnished the workers after completion of their shifts.

It is not our purpose in this paper to read the many excellent provisions of the Standard Bill, to which allusion has already been made; and of which we fully approve.

There remain, however, for discussion the three really vital factors in the causation of compressed air illness, viz.; amount of pressure, length of exposure to pressure or hours of labor, and rate and time of decompression.

(a) The amount of pressure must of course be governed by the physical laws of hydrostatics and will vary with the depth at which the work is being carried on.

We agree with the provision of the bill that except in case of emergency, no work shall be allowed where the air pressure exceeds 50 pounds, which degree of pressure seems to approximate the limit of human endurance.

(b) The length of exposure is subject to control, and in its provisions for hours of labor, the Standard Bill as adopted in New Jersey provides such shortening of these hours over those of the New York bill as must still further safeguard the air worker.

We see no occasion to suggest a further reduction in the length of exposure.

(c) The rate and time of decompression is by far the most important element in the etiology of compressed air illness, and it is not strange that there should be great divergence of opinion as to the minimum requirements and the method for decompression.

The air workers themselves as a rule strongly favor very short periods of decompression, and in their ignorance of the disease and their haste to leave the working chambers, they would undertake risks which are entirely unwarranted and dangerous.

The physiologists and scientific investigators stand at the other extreme, and urge decompression periods which are very long, probably unduly so.

Under these circumstances we turn with great satisfaction to the recommendations of a man like Mr. Henry Japp, an engineer of the widest personal experience in compressed air work and a thoroughly practical man, who at the same time has made an extensive study of the disease and has recognized the value of the brilliant work of Haldane, regarding the method known as stage decompression.

Certainly for tunnel work we would advocate the adoption of the stage method of decompression, and would accept Japp's table for time of decompression, as probably the best yet submitted; combining as it does the advantages claimed for the stage method, and at the same time reducing the length of the decompression to within perfectly practicable limits.

Japp's table provides, at least so

JAPP'S TABLE NO. 4.

Tunnel pressure (gauge).	Time worked	Uniform decompression (New York State law).	Maximum air saturation of body on emerging.	Stage decompression (based on table 2).	Maximum air saturation of body on emerging.
Pounds.	Hours.	Minutes.	Pounds.	Minutes.	Pounds.
28	3¾ and 3¾	18⅔	25.70	14	25
36	3 and 3	24	30.25	36	25
41.99	2 and 3	42	31.25	37	25
45.99	1½ and 1½	46	32.00	35	25
50	1 and 1	50	32.50	33	25

far as mathematical calculations are correct, that the "residual saturation of the tissues, upon emerging from the lock, shall not exceed 25 pounds" and so great an authority as Haldane has said regarding Japp's proposal that it "would seem to be consistent with reasonable safety," and "that there can be little doubt that for the great majority of men, a pressure (*i. e.*, residual saturation) of 25 pounds would not cause appreciable danger," "although the pains in the joints, etc., which are the most easily produced and least serious symptoms of caission disease would not be prevented." (Haldane Trans. Am. Soc. Civil Engineers, Vol. LXV, 1909.)

Japp has prepared a table showing a comparison of the New York State law requirements, of uniform decompression, with his own proposal for stage decompression.

It is hereby shown that the stage method would require less time for decompression from pressures up to 28 pounds, also less time for pressures about 36 pounds.

The greatest fault of the New York State law affects the decompression periods from pressures between 30 and 35 pounds, because in this space of 5 pounds, begins the real incidence of serious and fatal cases, and the New York law falls about ten minutes short in regard to this danger zone.

In the Standard Bill as adopted in New Jersey, owing to the shorter periods of exposure permitted, this fault is not so striking.

That all three of the bills alluded to, provide for considerably shorter decompression times in caisson work, is an inconsistency which merits an explanation; and we find that there are certain practical considerations which have led to concessions in the case of caisson work; and the shorter periods correspond very closely to the "Proposed rules to be observed in work under compressed air" submitted in 1909 to the New York State Commissioner of Labor by twenty-one engineers, doctors and contractors. Among the considerations which are advanced may be stated the following:

(1) The air locks in the caissons are very small, although they represent a greater proportion relative to the size of the working chamber than is the case in tunnels.

Consequently it is usually necessary for the men to stand, often in bent and cramped posture, and crowded quarters, during decompression; also there is danger of vitiation of the atmosphere under these conditions.

(2) It is commonly claimed that owing to the necessarily frequent moving of caissons, and to the presence of bucket hoist openings, the air lock is responsible for appreciable leakage, and that this leakage is especially noticeable during slow decompressions.

(3) Fewer men are employed under high pressure in caisson work nor is the high pressure work long continued as in tunnels.

(4) The caisson worker has as a rule better opportunity to habituate himself to increased pressures, for he starts at very low pressures and only very gradually attains the high pressure which then may be necessary only for a few days.

Hence we are inclined to regard with leniency the shorter decompression periods for caisson workers, but we should demand that even in caisson work, the tunnel rates for decompression should apply as far as conditions will allow. On the other hand in tunnel work where very large numbers of men must work for many months at dangerously high pressures, and where the locks are large, benches provided, and the air space ample; no concession should be allowed and we should insist on the adoption of those measures of prevention which we believe epitomize the results of scientific and practical work which has up to this time been recorded in the study of compressed air illness.

RECENT PROGRESS IN VENTILATION.

Frederic Bass

Report of the Committee on Air Supplies to the Sanitary Engineering Section, October 18, 1917, at Washington, D. C.

DURING the past year reports of research and experiment on air supplies have placed emphasis upon the qualitative rather than the quantitative phase of the problem.

The work of Dr. E. V. Hill of Chicago is notable. He has devised an ingenious device for determining dust and also a combination score card or synthetic air chart consisting of scaled divisions for temperature, humidity, dust bacterial count, odors, carbon dioxide and quantity, and a summary of these.

The New York Ventilation Commission has had five principal topics under consideration which may be described as follows:

1. A comparative study of the air conditions and the sensations produced on the occupants in two types of ventilated rooms, observed side by side in the same school building, the two ventilation types being the open window room with gravity exhaust, temperature kept from 64° to 68°, and the closed window, plenum fan ventilated room, with gravity exhaust, temperature being kept in the neighborhood of 68°.

2. A study of the efficacy of humidification in a schoolroom, comparison being made with a neighboring room of nearly identical arrangements but without humidification. Records were made of the air conditions, of the opinions of the teachers concerned, and the commission's staff observer, the physical condition of the pupils at the beginning and end of the experiment, the mental proficiency of the pupils at the beginning and end, and the prevalence of colds among the pupils.

3. From the two preceding studies there have been derived certain facts bearing on the subject of dryness in schoolrooms, which matter was presented in a paper by Mr. Palmer, chief of the Investigating Staff, before the summer meeting of the American Society of Heating and Ventilating Engineers.

4. A study of the air conditions in open window, gravity exhaust schoolrooms and closed window, fan ventilated, gravity exhaust schoolrooms, and their effect on the body sensations of occupants of high school age.

5. A study of the prevalence of respira-

tory sickness among school children in differently ventilated types of schoolrooms.

METHODS PURSUED IN ABOVE STUDIES.

1. A study of the open window, gravity exhaust schoolroom as compared with the closed window plenum fan ventilated schoolroom: This study was the continuation along somewhat modified lines of studies conducted during 1915. In the present instance three plenum fan ventilated schools of the better type were selected and six rooms in each school were chosen for study. Three rooms in each school were ventilated under the fan system of the building. The other three rooms in each school were cut off from the plenum fan, fitted with window board deflectors and made to depend for their ventilation on the natural circulation through the windows and the gravity exhaust duct.

About six weeks were spent continuously at each school, an observer on the commission's staff putting in full time in passing about from room to room making the required observations. In this manner it was possible to study the operation of these two ventilating methods under like weather conditions, with occupants of approximately the same age and numbers, and with rooms of similar construction and exposure.

2. Humidification: This work was carried on in the two rooms in one of the New York City schools which had been fitted up specially for experimental purposes and which were described in the June issue, 1917, of the *Heating and Ventilating Magazine* (Vol. v, No. 127).

Pupils of the sixth grade, in equal numbers, were assigned to these rooms in the fall of 1916 and remained under observation until April, 1917. Physical and mental examinations were conducted at the beginning and at the end of the period. Inasmuch as the course of air flow through the two rooms differed, the classes were shifted about several times, the group that was first in the humidified room, however, being always subjected to humidified air, and the dry air group being exposed to the unhumidified air throughout.

During the first half of the experiment the temperature in the two rooms was kept about the same. Under this arrangement the humidified rooms always felt warmer. In the second period, the total deheating effect of the air in the two rooms was kept the same, this being judged by the readings of a special instrument called a "comfortimeter" devised for this purpose by Professor Phelps of the commission. This plan resulted in the temperature of the humidified room being kept several degrees lower than in the other room. The difference in relative humidity between the two rooms averaged close to 14 per cent throughout the entire period.

Records of respiratory illness were kept by a nurse attached to the City Department of Health, this data being part of that collected in a great many schoolrooms in the course of a special study of this question.

The mental studies in this experiment have been reported by Thorndike and Kruse in *School and Society* (Vol. v, No. 127, 1917).

3. Dryness in schoolrooms: The cause of dryness in schoolrooms, the distinction between dryness of and dryingness air, and the significance of relative humidity have been made the subject of a paper which was presented at the summer meeting of the American Society of Heating and Ventilating Engineers and reported in the July issue, 1917, of the society's *Journal* (Vol. xxiii, No. 4).

4. The association between air conditions and bodily sensation of comfort: Two months, one in the fall of 1916, and one in the winter of 1917, were devoted to a study of the effect of differently ventilated rooms on body comfort. Four squads of twenty-

four girls, each of high school age, were escorted first to a window ventilated room, and then to a closed window fan ventilated room and their opinions of temperature, odor, freshness, etc., were recorded. A single squad was used for about two weeks continuously. A half hour was spent in each type of room each day. The order of the rooms was altered so as to balance out any effect of sequence. It has been said that an open window room feels "fresher" and "livelier." Air analyses usually fail to account for this feeling. The present study was an effort to get at the bottom of the cause of this difference in sensation. The two types of rooms were so ventilated as to be almost identical in temperature and humidity. Differences in the feelings of the rooms must then be due to conditions peculiar to the method of admitting and extracting air. To eliminate extraneous influences which act on the visual senses in determining a choice, the subjects were blindfolded and were led about the halls in such a manner as to confuse their sense of location before being taken into the classrooms.

5. The influence of classroom ventilation on the prevalence of respiratory sickness among school children: This study was inaugurated by the Bureau of Child Hygiene of the New York City Department of Health and the Ventilation Commission was called in to coöperate in the work. During the spring of 1916 2,500 public school children distributed over a number of schools in different parts of the city were placed under close observation by nurses and physicians of the Health Department. Each classroom was visited twice a day and every absentee was noted and the cause of the absence determined by a visit to the home. A record was also kept of those children present in school who were suffering from respiratory affections. This study was continued for eight weeks. The children were about equally divided among three main types of ventilated rooms, viz., (a) open window, low temperature rooms, the thermometer ranging from 55° to 60° F.; (b) open window rooms with temperatures from 64° to 68°; (c) fan ventilated, closed window rooms with temperatures around 68°.

This study was repeated in the winter months of 1916 and 1917, about 3,000 children being under observation at this time. For the most part the same schools and the same rooms were used but of course with an entirely new lot of pupils and with a new set of nurses.

Records of temperature and relative humidity and the general impressions of the air were made by the nurses in addition to the records of illness among the pupils.

The results of these various studies have not been completely worked up and no published reports are available other than those already specifically mentioned. The compilation of the commission's final report is now under way but in all probability this work will not be ready for the press before 1918.

In general, the committee may report that while considerable research has been in progress, the results are not yet available for discussion or use in practice.

THE PREVENTION OF HAY-FEVER AS A NATIONAL PROBLEM.

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THERE is no preventible disease of serious importance that has received so little attention as hay-fever. Although ranking as one of the most common of the non-fatal diseases, it is only recently that any organized efforts have been made for its prevention.

The records of the American Hay-Fever Prevention Association show that about 1 per cent of the population of the United States is subject to hay-fever* so that the number, about one million, is sufficient to demand the most earnest consideration.

The serious effect of hay-fever is not well understood. From one to two months, and sometimes much longer, the victim of hay-fever suffers from symptoms which depress his vitality and lower his energy. Asthma and bronchitis are complications in a large number of cases. In our Hay-Fever Clinic at the Charity Hospital we have had, during this season, two cases of hernia from violent sneezing, one case of mastoiditis and many other complications of minor importance. Marked nervous depression is common among hay-fever sufferers as a result of the prolonged respiratory disturbances.

The etiologic relation of pollen to hay-fever and hay-fever to asthma is now so well established that its consideration need not delay us at this time. Its recognition, however, is an important factor in instituting practical methods for the prevention of hay-fever. The American Hay-Fever Prevention Association has for several years, through the medical and lay press and the state boards of health, kept this fact before the public so that it would be in a receptive condition for active legislative methods for the prevention of hay-fever.

Briefly stated, about 90 per cent of the fall cases of hay-fever in the Eastern and Southern States are due to the common and giant rag-weeds (ambrosia elatior and trifida), the remainder being due to the cockle bur (Xanthium), marsh elder (Iva) and a few other weeds, most of which are only of local importance.

In the Pacific and Rocky Mountain States these are replaced by the wormwoods (artemesia) and other weeds a description of which is given in our article published in the Reports of the United States Public Health Service.

The golden rod, roses and rosin weed, associated with hay-fever in the public mind, are not responsible. Their pollen is never found on our atmospheric pollen plates which are exposed during all seasons to detect the various pollens found in the atmosphere.

Vernal hay-fever is due principally to the pollen of the grasses (in addition to that of the amaranths (amaranthus), chenopods (chenopodium) Russian thistle (salsola) and yellow dock

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* Hay-Fever, Its Relation to Seasons, Occupations, Sex and Color. Scheppegrell, *New York Medical Journal*, December 9, 1916.

(rumex).† The pollens of the trees are responsible for hayfever, only in certain localities.

PREVENTION.

Hay-fever may be prevented by carrying out certain methods, which, fundamentally, are simple. Being principally due to the pollen of weeds, the remedy evidently is the control of these where their pollen may be carried to the human respiratory organs.

As it is impracticable to destroy all weeds, it is important to know their potential area—that is the space to which their pollen may be carried—so as to determine the distance to which they should be excluded.

The pollens which cause the early hay-fever are relatively large (30 to 60 microns) so that their potential area is not great.* While this varies, due to different wind velocities, one mile is sufficient protection from most of these.

The pollen of the common rag-weed (ambrosia elatior), however, measures only 15 microns and its buoyancy is so great that it will traverse a distance of five miles in a wind of twenty-miles-per-hour velocity. To be effective, therefore, these weeds should be excluded to at least five miles from populated areas.

LEGISLATIVE METHODS.

Legislation for the effective prevention of hay-fever should include municipal, state and federal laws. City ordinances should not only be enacted against weeds, but, to be effective, should specify that when the propertyholder does not cut his weeds, the city may have this done at his expense. In many cases, this is economical not only for the city but also for the property owner.

State laws should specify that land within one mile of municipalities should not be allowed to reach the pollinating stage, and, in the case of the rag-weeds, this distance should be five miles.

The real solution of the hay-fever problem, however, is within the power of the Federal Government. Should it be declared a violation of the Interstate Law to transport seeds of ragweeds and other hay-fever weeds from one state to another, the farmer in self-defense would be compelled to destroy these weeds on his farm. This would not only result in an enormous reduction of hay-fever weeds, but would also be of great benefit to the farmer, as the United States Department of Agriculture has repeatedly shown that millions of dollars are lost annually from the neglect of weeds.

While such plans may at first sight appear radical, similar ones are already in force for the protection of our agricultural interests. The transportation of diseased plants and trees into certain states is punishable with severe penalties and there has been no great opposition to their enforcement.

When we realize the great amount of suffering that may be prevented by these means, which at the same time tend to improve the efficiency of our agricultural methods, the enactment of such laws should be strongly urged by all those interested in relieving mankind from the oppression of this distressing disease.

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* A Year's Work in Hay-Fever Prevention in the United States. Scheppegrell, AMERICAN JOURNAL OF PUBLIC HEALTH, Vol. 7, No. 2.

† Hay-Fever: Its Cause and Prevention. Scheppegrell, *Journal of the American Medical Association.* March 4, 1916.

* Hay-Fever and Hay-Fever Pollens. Scheppegrell, *Archives of Internal Medicine*, June, 1917.

PLUMBING AND DRAINAGE OF BUILDINGS.

Preliminary Report of the Committee on Plumbing and Drainage of Buildings to the Sanitary Engineering Section, American Public Health Association. Read at Washington, D. C., October 18, 1917.

THIS committee was appointed with the understanding that it was to consider the broad general principles of plumbing design, without going into the details of the actual methods of installation, and then make general recommendations that could, if adopted by this section, be referred to as authoritative by health officials who are entrusted with the work of drafting municipal plumbing codes.

The prompt removal of household wastes is of the greatest importance to the health of a community, and this can only be accomplished by the introduction of adequate plumbing and drainage systems and by the abolishment of privy vaults and cesspools. Furthermore the health of the occupants of buildings is better maintained if a copious supply of water is available for purposes of cleansing, and if the plumbing fixtures of all kinds are conveniently located for the purposes for which they were designed. It is also known that sewer air may have the property of lowering the bodily resistance of those who are obliged to breathe it continuously, notwithstanding the fact that communicable diseases are seldom, if indeed they are ever, traceable to sewer air.

The plumbing and drainage of buildings, therefore, has a direct relation to the public health and is properly a function of health work that should be considered by the American Public Health Association, and health officials should insist upon the adoption of a plumbing code that is in accord with the best sanitary practice. The enforcement of the provisions of such a code should be left to trained plumbing inspectors. The question as to whether the administration of plumbing ordinances should be under the jurisdiction of the health department, or of the building department, is one of administrative detail and may be answered definitely under definite conditions. While there is an apparent duplication of inspection in the system whereby the buildings are inspected by the building department and the plumbing by the health department, this duplication is more apparent than real, since in any case these inspections must be made by a separate personnel. The enforcement of the provisions of a plumbing code by the health department furnishes a trained personnel for reinspection and for the inspection of nuisances connected with defects in existing plumbing, which would not be available if plumbing inspection were left with the building department. In certain small communities, there is no building inspection and the function of plumbing inspection may properly be combined with that of general sanitary inspection, to the advantage of the health department. The above is likewise true in regard to the examination and approval of plumbing plans and specifications. Plumbing plans and specifications are generally separated from the general building plans, meriting the attention of those well trained in plumbing practice.

Plumbing in reality constitutes the capillary system of the water and sewer systems of our cities. Plumbing should, therefore, never be considered from a building inspection standpoint, any more than should the original building of water and sewer systems be considered from the point of view of street or highway construction. In its relation to the department of health, plumbing construction in new buildings compares with the construction of new water and sewer systems, for indeed it is the connecting link between the water supply system and the sewerage system.

The rules and regulations governing plumbing should in all cases apply equally and include all apparatus for introducing the water supply to the plumbing fixtures, and removing the liquid and water-carried wastes through the drainage system to an approved sewerage system. Water services and house sewers are important links in the chain that involves complete plumbing and drainage systems, and the importance of inspection and tests before they are concealed or enclosed, is essential.

This introduction permits of the following summary:

1. The health of a community demands the prompt removal of all household wastes.

2. This can be accomplished only with a copious supply of water and through properly designed drainage systems.

3. The drainage system must be so designed that sewer air does not find its way into the building, for although no specific disease would result therefrom, the vitality of the occupants might be lowered.

4. This necessitates the adoption of a plumbing code that should be drawn up by or approved by health officials.

5. The enforcement of the provisions of the code requires competent inspection of the work.

6. The duties of a plumbing inspector, superintendent of sewers and sanitary police, are so closely related that a versatile official can usually be employed to fulfill the duties of the three positions in the smaller municipalities.

7. The abatement of nuisances connected with defects in existing plumbing is simplified by having a personnel of trained plumbing inspectors.

8. The chief concern of a health department in regard to plumbing is to have it so installed that no menace to health and no nuisance will result.

9. No menace to health and no nuisance will result if the pipes are adequate in size and arranged so as not to cause obstruction, if there is a plentiful supply of water with which to flush fixtures, if the installation is of such substantial construction that sewer air cannot enter the building, if there is no possibility of contamination of the drinking water supply, and if the material of all fixtures is nonabsorbent.

If these facts are admitted, the general fundamental principles of plumbing design should be as follows:

1. The system should be as simple as possible.

2. All unnecessary pipes should be omitted, to save expense to the owner, and to reduce the number of joints that may become defective.

3. Every fixture trap should be protected from syphoning and back pressure, and a circulation of air assured.

4. Only extra heavy grades of adopted metal pipe, fittings and traps should be permitted within the building. A system of piping that will not corrode easily, nor be affected by sudden changes in temperature, with the joints equally as strong as the pipe itself, should be installed. Frost should be guarded against in locating pipes and fixtures.

5. The size of waste pipes should be ample for the fixtures which they are to serve, but not so large that the scouring effect of the flush will be lost.

6. All main waste pipes should be extended through the roof to a point at least two feet above all windows that are within twenty feet of such pipes.

7. Water supply pipes and flush tanks must be of such a size that an ample flush can be obtained for each fixture and cross connections with dual supplies must be avoided.

8. All water closets should be placed in compartments that have ample external light and ventilation.

9. Water closet fixtures should be connected with the soil pipe by a joint that will remain permanently air tight.

10. The running trap and fresh air inlet need not be required except in special cases, such as where houses are terraced, one above the other, in cases where main sewers are exceptionally foul, or where the majority of houses in a built up section are already provided with such traps. The trap retards the flow, retains solids and often becomes entirely blocked, thus creating a nuisance. Sewer air is no worse than house drain air, and if the plumbing system guards against one, there is no danger from the other.

11. All pipes must be run in as direct a manner as possible, and no changes in direction should be made with less than 45° fittings, except in vertical lines where TY's may be used. A sufficient number of cleanouts must be provided to permit the removal of any possible obstruction.

12. The water test must be applied to all work before it is concealed or enclosed, and the pressure smoke test must be applied to all work when the building is completed and ready for occupancy. The peppermint test is unsatisfactory.

The committee recommends that publicity be given to this preliminary report, and it hopes that all criticism that may improve the recommendations herein set forth will be sent promptly to the chairman. The committee requests that it be continued for another year, in order that it may make a final report in the light of the discussion brought forth by this preliminary report. It is believed that the adoption of broad, general principles of plumbing design by this section will result in much greater uniformity of the plumbing regulations of American municipalities, especially with the active coöperation of the members of the Association, which coöperation is earnestly solicited.

Respectfully submitted,
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MEDICAL DEPARTMENT RECORDS, MORBIDITY REPORTS, AND VITAL STATISTICS OF THE NAVY.

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Read before the Annual Meeting of the American Public Health Association, Section on Vital Statistics, Washington, D. C., October 17, 1917.

IN THE following remarks the attempt will be made to give a brief, yet somewhat detailed description of the nature and kind of statistical data collected by the Medical Department of the United States Navy.

To understand our methods of collecting and compiling statistics it is necessary to know that permanent records must be kept in file in the Bureau of Medicine and Surgery to serve two distinct purposes—records which will satisfy the needs of the Pension Bureau as well as furnish all data required for necessary statistics—statistics for current use in connection with measures for the prevention and control of communicable diseases, statistics which will indicate at all times the distribution and condition of the sick of the Navy, and figures for publication in the annual report of the Surgeon-General which includes a retrospective view of the activities of the Medical Department during the year.

It is highly desirable that one system of records shall be made to serve all purposes. The records must be adequate and yet the system must be thoroughly routine and simple in practice in order that it may stand the tests of emergencies under war conditions.

Description of the system which has been in use since 1910, with its various key letters, may leave you to doubt its simplicity, but however complicated it may seem on first examination it is in fact simple and satisfactory in practice, both in the field and on board ship. From the central office standpoint—the Bureau—it serves both pension requirements and statistical necessities quite well, and it permits expansion of the Navy, either sudden or great, to be followed closely and to be taken care of without confusion or loss of time except that which is necessarily incident to the training of additional clerical force. Much credit is due Assistant Surgeon C. E. Alexander for devising the system and perfecting it in operation.

Any officer or enlisted man belonging to the Navy may, sooner or later, by disease or injury, acquire a disability which will entitle him to a pension, or to the highest rate of retired pay, if the disability which leads to retirement or discharge from the service is determined to have been acquired in line of duty. In the Bureau of Medicine and Surgery there must be readily available accurate medical and service records of all persons who have served in the Navy. The medical history of every person must be kept in such form that it can be referred to at any moment, whether the individual be under treatment at present, in a Naval Hospital, perhaps, with some question as to the origin of his disability pending, or whether the circumstances to be ascertained occurred years ago. The data at hand must be sufficiently complete to permit two important questions to be answered. The first is, "What was the origin of the disability; in line of duty or not in line of duty?" and the second is, "What was the nature and degree of the disability when the individual was found unfit for service?" Determination of the origin of disease or injury, which has caused death or disability, sometimes brings into consideration questions of a complicated nature, and frequently the evidence must be referred to the Judge Advocate General of the Navy for his legal opinion.

Origin, and the pensionable status, are both large subjects but they are outside the scope of this paper, and the foregoing is sufficient to indicate that pension questions alone make it necessary to preserve accurate data, amounting practically to complete medical histories of all who serve in the Navy. Such records have been kept from the earliest times, but forms and filing systems have been changed from time to time. So long as the Navy was small it was a comparatively simple matter to keep the records in books, but now with the most modern system of recording, a large amount of space in the Bureau is required for file cases alone, and more floor area is being demanded constantly. Files which contain records of personnel, and statistical data relative to them, have to do primarily and conjointly with the work of two divisions of the Bureau,—the Record and Pension Division and the Sanitation Division. From the viewpoint of the first they may be termed records; for the purposes of the latter they become statistics.

All records, or all statistics, as you please, are based upon the individual health record. This system of health records—one for every person belonging to the Navy, to accompany him throughout his service, and to be held in custody by a medical officer—was adopted in 1910, and its use since then has given great satisfaction.

The Health Record is a loose-leaf booklet bound with metal clasps. All pages are removable. The first sheet contains lines for census data, and lines for a descriptive list of the physical characteristics of the individual. On the back of this sheet there are diagrams of the body in which identification marks and scars may be indicated with red ink. Following the identification pages there are several sheets for medical history. There is a sheet for the dental record, to be filled in by dental officers, pages for abstracts of the health record, a page for vaccination records, and a page to be filled in upon termination of service. The filling in of that is the act which closes the health record.

The abstract pages are for entries which summarize the information given at length in the medical history sheets; diagnoses, dates of attachment and detachment, places where treated, the number of sick days, whether or not physically desirable for the service, and the signature of a medical officer suffixed to each entry. There is also a yellow sheet, termed the syphilitic abstract which is to be inserted in the enlisted man's health record in all cases where there is a history of syphilis. On one side of the abstract there is space for a dated statement over the patient's signature to the effect that the nature of the disease has been explained to him, he is convinced he has syphilis, he recognizes prolonged treatment and several tests will be required for a cure, and he is anxious and ready to take necessary treatment. On this page space is provided for diagnostic evidence, description, serum reactions, and the signature of the medical officer making the diagnosis. The other side of the sheet is an abstract of treatment. Entries on this page should give a succinct and authentic account of the progress of the case, including essential facts relative to treatment from the time the patient first came under the observation of a medical officer of the Navy.

The potential dangers of syphilis in a given case are likely to be overlooked because of frequent transfers in the service. The syphilitic abstract prevents that and insures proper sequence and continuation of treatment upon transfer from one ship to another. The abstract is given a color in order that syphilitic histories may be recognized at once when a large number of health records are received together as in the case of a large draft of men coming on board at the same time.

The health record of every officer and enlisted man accompanies him throughout his service. In the case of an officer, if any entries have been made, the loose medical history sheets are removed and forwarded to the Bureau of Medicine and Surgery at the end of the calendar year, and upon promotion. In the case of an enlisted man, the health record is closed upon termination of service, whether by expiration of enlistment, discharge, desertion, or death. When immediate reenlistment follows expiration of enlistment all abstract pages are removed and transferred to the new health record. In all other cases the entire record, properly closed, is forwarded to the Bureau.

Whenever any person in the Navy is found to be incapacitated by disease or injury to the extent that it becomes advisable to relieve him from duty his name is put on the sick list and the pertinent facts in the case are entered in his health record. In this connection, after the date and name of the place—ship, station, or hospital—the diagnosis is entered strictly in accordance with the terms of the Navy nomenclature. In the margin to the left of the diagnosis is written the capital letter, "A" which is to be read, "Admitted to the sick list," or the letters, "RA" which mean, readmitted to the sick list as with the diagnosis there written, it being understood in that event, he has been admitted before under the same diagnosis, the letters, "RA" signifying that he has never fully recovered from the disease or injury indicated. For example, a patient with synovitis of the knee, or acute bronchitis, or gonococcus infection of the urethra appears to be fit for duty after a few days' treatment, but a day or two after he has been discharged to duty it is recognized that further rest in the sick bay, or perhaps even bed treatment, is necessary. He is then readmitted (RA). In cases of acute disease—for instance, acute follicular tonsillitis, where complete recovery has taken place, to be followed later by another separate and distinct attack—a new original admission is made and indicated in the margin by the letter "A."

These key letters are used in the margin as described: A, admitted to the sick list; RA, readmitted; C, diagnosis changed.

The letter "C" is written in the margin to the left of the new diagnosis. The change may have been made on account of error or because a complication has become the paramount cause of disability. The letter "C" is used also when a change of diagnosis is occasioned by some intercurrent infection or injury, or because some chronic affection has become relatively the most important affliction. Sometimes during convalescence advantage is taken of opportunity to administer treatment for an old inactive affection; a dose of salvarsan, removal of an ingrowing toe-nail, treatment of a deformity following an old injury, etc. In such cases the proper letters, "A" or "RA" are to be entered immediately below the, "C", after numerals indicating the number of sick days recorded under the first diagnosis. In case convalescence from the first disease or injury is complete or nearly complete and it should become necessary or advisable to change the diagnosis the proper thing is to discharge the patient, inscribing the letter "D" and then immediately to admit or readmit him as the case may be, under the new diagnosis. The letter "D" in the margin signifies, "Discharged to duty." It means that the patient is fit for duty. "D" is also used where admission is to occur immediately under another diagnosis as just described, the assumption being that he would have been fit for duty in so far as recovery from that particular complaint was concerned. In cases where sick leave is granted before return to duty, the letter "D" is entered and the patient is discharged upon the commencement of his leave.

The letters, DD signify, "Died" (discharged dead); T, transferred; R, deserted while on the sick list (ran); IS, invalided from the service. (Discharged upon approved recommendation of a Board of Medical Survey.)

The number of sick days charged against a patient for the diagnosis under which he is carried (either A or RA) is entered always in the margin immediately below the letters indicating the disposition of the case; "T" or "C", temporary disposal; "D", "DD", "R", or "IS", permanent.

Immediately below the diagnosis, which has been selected from the official nomenclature, a statement is made invariably in reference to origin. It is written, "Origin in the line of duty" or, "Origin" not in the line of duty. This declaration of the medical officer's judgment is followed by a summary of the evidence relevant to the case.

A key letter is required with every diagnosis relative to an injury. The key letters are to be interpreted as follows: A, suicidal; B, homicidal; C, conflagration, including all injuries incident to general conflagration (burns received otherwise are not classed hereunder); D, accidental drowning or submersion; F, traumatism by explosion, including powder, gas, compressed air, steam explosions, or the explosion of a gun; E, traumatism by firearms, accidental (E includes all injuries caused by the projectile, the blast from great guns, or from the piece when fired); G, traumatism by fall; H, traumatism by machines; I, traumatism by other crushing; J, traumatism due to athletic sports; K, casualty in action on an organized enemy.

Specialty letters indicating occupational influence are also used, in injury cases with, but hyphenated after, the above: R, aeronautic duty (for diseases or injuries incident to actual flying); S, submarine duty (for diseases or injuries incident to actual maneuvering of or accident to submarine boats); U, diver's duty (for diseases or injuries incident to actual diving).

These key letters make it possible for the statistical card (Rough form F, to be described) to include by the use of a single letter a somewhat comprehensive etiological classification of injuries.

When the origin is stated as, "Not in line of duty" it must also be indicated whether or not the disease is the result of misconduct. It is also well to clear up any doubt as to contributing negligence on the part of the patient. In the case of disease due to misconduct, the patient loses pay while he is on the sick list. While under treatment but performing duty he does not lose pay. The Comptroller of the Treasury has ruled that the law providing for checkage of pay applies only to diseases and not to injuries; that is, not to wounds or accidents. In our table, poison cases, among which alcoholism and narcotism are included, are classed as special injuries. Loss of pay applies to them.

After the comment in reference to origin a brief clinical history is entered together with a summary of important symptons and physical signs; notes on the progress of the case, and always a statement as to the actual amount of disability at the time of discharge. Only notes that mean something of real significance are desired. In general, a record should be made of all laboratory findings, all essential elements of treatment; surgical operations, salvarsan, sera, etc.—anything that may bear on the subsequent medical history of the individual, for the health record is both a continuous medical history and a pension record.

Great care is taken to secure the precise information required, accurately recorded. Not only have medical officers been instructed as to important details, but full instructions are printed inside the covers of each health record for ready reference.

As indicated above all medical statistics of the Navy are based upon health record notations and they must agree always with key letters, dates, diagnoses and other data as written therein. Each entry in the health record must be signed in ink by a medical officer, whenever a medical officer is available, and each entry becomes a matter of official record. On board certain small craft and torpedo boat destroyers, which do not carry medical officers, health records are annotated by chief pharmacist's mates, but in case of serious illness or injury the patient will be transferred to some other place, or be visited by the medical officer of the fleet or flotilla tender and thus, sooner or later, a statement in the health record, meeting possible pension contingencies, will be signed by a medical officer. Accuracy, from the statistical viewpoint, will also be conserved.

Of the various statistical reports forwarded to the Bureau of Medicine and Surgery, the Rough form F—a statistical card pure and simple—is the first to be described. This card is made out in duplicate on the typewriter. Instructions printed on the back of the ribbon copy card, known as the original and so labelled, cover precisely what is to be written on each line, and every line is numbered. The printed matter on the card labelled "Original" is in black; that on the other half, which is labelled "Duplicate" is in red. After the card has been completely filled in, the "Duplicate" is detached, and retained in all cases at the place from which the original is forwarded to the Bureau.

All data inscribed on this statistical card is copied exactly from the health record. The medical officer is responsible for accuracy, but in practice the compiling and forwarding of cards is entrusted to the chief pharmacist's mate or other responsible hospital corpsman in charge of the clerical work.

The card is essentially a morbidity report and it carries the usual items; name, age, nativity, diagnosis date of admission, date of discharge, result, and number of sick days. The date and place of enlistment, the place from which received, if the patient has been readmitted from some other ship, station, or hospital, and the place to which transferred, if transfer occurs, also appear on the card. Admission, readmission, change in diagnosis, transfer as a patient, death, discharge to duty, desertion, discharge from the service by Medical Survey, and etiological classification of injuries are all indicated by key letters as used in the health record. Origin is expressed, "D", duty; "ND", not duty.

A form F card is required for every admission or readmission. It is the duty of the clerical man, usually a chief pharmacist's mate or a pharmacist's mate, first class, to fill in the card as soon as the patient has been admitted to the sick list. Upon disposal of the case, either temporarily, by transfer or change of diagnosis, or permanently, by discharge, death, desertion or discharge from the service, the necessary data are available for completing the card which can then be released. It is expected to be forwarded to the Bureau immediately, by the first mail into which it is practicable to put it.

When cases are retained on board ship the cards cannot be completed and forwarded until the patients have been discharged or otherwise disposed of. When the diagnosis is changed a new card is prepared to record the new diagnosis, and a note is made on the back of the first card before it is sent to the Bureau, stating the new diagnosis and the reason for change—

error, complication, intercurrent disease, injury, etc. At the same time a note is made on the back of the new card to indicate the former diagnosis and the place from which the patient was received originally. This is done because it has been the practice in naval hospitals to admit all patients as from the hospital when changing the diagnosis. When a patient is transferred to another place—ship, station, or hospital—he is taken up immediately at the new place as a readmission (RA). He must be readmitted with the diagnosis under which he was transferred as written in his health record. If the diagnosis is recognized to be wrong it can be changed.

It is of importance in connection with a communicable disease only that the card be despatched to the Bureau as soon as the case is recognized. That occurs in the great majority of cases, for it is recognized everywhere in the service that these diseases are disseminated largely by close personal contact, through the contamination of individuals by the moist secretions of those already infected. Emphasis is laid upon the necessity for unfailing segregation of recruits at training stations for a period of twenty-one days. At all shore stations and on board ship, where a large number of men are quartered and often over-crowded because of essential service conditions, the paramount importance of early detection of cases and prompt removal of patients is recognized. Separation of the contacts of each type of disease in segregation for observation is the rule, and all carriers in connection with such diseases as diphtheria, cerebro-spinal fever, malaria, and typhoid fever are detained until it is demonstrated that they will no longer menace the main body of men. Since the contacts, who may develop clinical symptons, are under constant observation, early detection of cases is the rule, and in practice, patients are almost always removed to a naval hospital at once, no matter how mild the case may be. In the ordinary course of events the form F card is mailed as soon as the patient has been transferred. Usually it is received in the Bureau the following day. That is true for the Atlantic Coast; an extra day is required for cards coming from Chicago and, of course, more time is lost in transit from the Pacific Coast. However, telegraphic reports are made from the more distant points when circumstances indicate them.

These cards represent practically daily morbidity reports of communicable diseases. The important thing is that they are authentic reports, agreeing in all particulars with the health records; and inasmuch as it is a routine procedure to forward cards immediately, not only for communicable diseases but for all other diseases and injuries as well, the cards cannot be forgotten. Very few cards are lost in transit but should a card be lost it will merely cause delay. All cards are checked in the Bureau with the smooth form F which is received from every shore station and ship at the end of the quarter. A case transferred to hospital will appear in form I, weekly report of sick, prepared every Saturday. The number of cards failing to reach the Bureau promptly has been insignificant

Cards are not sent in for cases of communicable disease retained on board ship until they have been terminated, but, on the other hand, patients with these diseases are not kept on board, as a rule, when transfer to a naval hospital or hospital ship is possible. It makes no particular difference anyway. The larger ships have ample and adequate hospital facilities with trained attendants for the care of any kind of cases. A moderate number of men ill with communicable diseases can be handled on board ship as well if not better than at a shore station because there are facilities for isolation of patients and the entire personnel can be observed very closely. For one thing, the discipline is better than it is at training stations, naturally, and it should be remarked that lack of discipline always has a definite influence on the prevalence of communicable diseases.

Eventually, cards in all cases reach the Bureau. We do not pretend to keep track of all cases occurring in ships from day to day. That is unnecessary and it would be impossible; the cases are not numerous enough and every ship has a responsible medical officer, capable of handling an epidemic, who will advise the commanding officer if unusual measures are deemed necessary. However, we do keep track of ship cases by charting them week by week with colored pins, so that a glance will show the types of diseases and the number of cases which have occurred in any particular ship over a period of several months. A battleship must be self supporting in her medical department as well as in all other departments. She is not like a liner or troop ship, making more or less regular trips between terminals. Smaller vessels may find it necessary to put into port for the purpose of transferring their sick. In such cases cards are forwarded.

Upon arrival in the Bureau, form F cards are sorted immediately and all that relate to communicable diseases, including acute tonsillitis, pneumonia, malaria, and the venereal diseases, are tabulated in loose-leaf ledgers under the headings to which the cards refer, ships, naval districts, naval stations, training stations, etc. Every place has a page for each month. There is a separate space on the page for each disease that we are interested in, for tabulating admissions, deaths, and discharges. The month is divided into quarters—days from the 21st to the end of the month falling into the last quarter. The number of cases of each disease carried over under treatment from the previous month is shown at the top of the page so that the number of sick may be known at any time in so far as reports received agree with actual numbers.

The three venereal diseases are tabulated for all stations by months, and separate records of the numbers of sick days are kept in all cases in order that damage rates as well as admission rates may be kept to serve as indicators of the efficacy of prophylactic measures in force at all stations.

Conditions vary so in different ports, foreign and domestic, that this cannot be done very well for ships, but ship cases can be checked very accurately at the end of each quarter.

In order to keep the communicable disease situation in all its details constantly before the eye spot maps and colored pins are used.

Groups of communicable diseases throughout the United States, as reported to us by the United States Public Health Service, are spotted on the map in order that we may observe the movement of disease toward our training stations. On the map there is a card for each naval hospital divided into columns for every month of the current and previous quarters with a space on the left for the registration of protracted cases which have been admitted at some time prior to the beginning of the previous quarter. Each column representing a month is subdivided into quarters or weeks to agree with the divisions in the accounting ledger. The same colors are used in all our visualization schemes. Colored inks are used in the preparation of graphs or blocks to agree with the colored pins. The colors are black for smallpox, yellow for cerebrospinal fever, purple for diphtheria, pink for poliomyelitis, deep blue for measles, white for german measles, red for scarlet fever, green for mumps, sky blue for malaria and brown for typhoid fever. A glance at the map will show the number of cases of these diseases under treatment in any of the naval hospitals at any time and it will show also in what weeks the cases were admitted. Some of the naval hospitals are adjuncts to training stations; others receive patients from Navy Yards and ships.

On another board there is a card for every ship, with divisions for every month of the year, and the space allotted to each month is divided into quarters. On these cards cases are spotted as reported and the pins are not removed until the end of the year. Surgeon Carrol Fox of the Public Health Service, on duty in Bureau of Medicine and Surgery, superintends this work.

All form F cards are examined for errors or omissions of data as soon as they are received in the Bureau; necessary corrections are made if they can be made without writing to the place of origin, and the cards are turned over to men operating punching machines. Here, special cards designed with numbers to account for all data contained on the original form F cards are punched by the machine, ready to be sorted by a Powers Accounting machine which will sort and distribute about 250 cards a minute. In the ordinary routine, cases are sorted in accordance with the Navy classification and nomenclature, with a view to preparing data for the annual report of the Surgeon-General. Of course, any information in the nature of special statistics can be gotten quickly by the machine, within the limits of data punched in the cards, age groupings, duration of illness, geographical distribution, percentages of readmissions, deaths, etc. There is one thing which we have failed to do with the form F card, and that is to provide a line for recording the nativity of parents, indicating race. The omission, very likely, will cause regret on the part of anthropologists, but the service has not felt the need of such data in the past and a change of the card even in such a small detail would have caused a great amount of confusion contra indicated in war times.

The form F cards are filed alphabetically after they have passed through the hands of the punching machine operators. At the end of the quarter they are checked in every case with the smooth form F received then from the place from which the cards were sent. This form is a list of the cards which have been forwarded during the quarter. It is prepared from the duplicates of the rough form F cards which have been retained at the place of origin. The names of patients are stated in strictly alphabetical order and a patient's name appears as many times as he has been admitted or readmitted during the quarter. If admissions appear for which cards have not been received the missing cards are secured and punching machine cards are prepared then so that in the end every case is traced and included in the statistics of the year. The smooth form F, quarterly report, is forwarded from all ships, shore stations and hospitals; in other words, from all places whence come cards.

Form K is a summary of disabilities from form F cards which have been forwarded. It is a quarterly report accompanying the smooth form F. The totals of patients taken up and disposed of must agree in all cases with the totals as written in the smooth form F. Form K includes a statement of the average daily complement of the place or station, based on the total number of daily rations, issued and commuted, as obtained from the supply officer's returns. From week to week we keep track of the population at training stations and training camps by means of weekly statements furnished by the Bureau of Navigation. Of course, ship complements do not vary like the complements of shore stations.

Form K-2 is a report of casualties, a

special report required for all wounds or injuries the result of accidents, loss of men overboard, explosions and engagements with the enemy.

Form I, a weekly report of sick from Saturday to Saturday, is sent to the Bureau by mail from all naval districts, from naval hospitals, from dispensaries serving in capacity as small hospitals, and from one training camp which has not a naval hospital as an adjunct. This report lists all patients in the order of admission to hospital with dates of admission, discharge and changes in diagnosis. Cases continued to the following week are marked according to condition as C, convalescent; F, favorable; U, unfavorable; S, serious. The probable date of fitness is also stated in each case, and at the head of the form a summary is given: remaining last report, admitted during the week, total, discharged during the week, and remaining at midnight Saturday.

Other forms which have connection with statistics are:

Form L, request for medical survey.

Form M, report of medical survey.

Form N, report of death.

A request for medical survey in any case is signed by the senior medical officer of the ship or station in which the patient is under treatment and the request is approved by the senior officer present afloat or by the commandant of a shore station, who appoints a Board of Medical Survey consisting of two or more medical officers, usually three. The report of a Board of Medical Survey is made on form M and it contains an expression of opinion signed by the Board as to origin, nature of the disease or injury, present condition of the patient, degree of disability, probable future duration, fitness or unfitness for duty, fitness or unfitness for the service, and recommendations, such as, to continue treatment, transfer to hospital, grant sick leave, or discharge from the service. No man may be discharged by reason of physical disability except per recommendation of a Board of Medical Survey, approved by the Surgeon-General of the Navy. All reports of Boards of medical survey are forwarded to the Bureau of Medicine and Surgery where they are acted upon by the Record and Pension Division, subject to the Surgeon-General's approval and signature.

Form N, report of death, indicates in itself the data required. These full reports are very important from the standpoint of the Record and Pension Division. From the statistical viewpoint the form F card serves as a simple death report. In unusual cases form N is referred to because it contains a full description of the last illness and usually autopsy findings if there has been any doubt as to the correct diagnosis. The closed health record will give the same information. The death certificate (form N) is prepared in triplicate—quadruplicate in the case of an officer. The laws and regulations for the Government of the Navy require that a record shall be made of all persons whose deaths occur in the naval service. These reports are required as evidence in claims for pension. Whenever an officer or enlisted man of the Navy or Marine Corps, who is not under the professional care of a medical officer of the Navy, dies in a civil hospital, at home, or abroad, a death certificate is to be obtained from the attending physician, upon the receipt of which a report of death will be prepared and signed by the Surgeon-General. All mortuary reports for life insurance are prepared by the Bureau of Medicine and Surgery. The regulations specify that in all cases of death where the official record may be incomplete the Surgeon-General shall decide as to whether such death occurred in line of duty.

Two other forms may be mentioned:

Form P is a report of surgical operations submitted to the Bureau annually.

Form X has to do with enlistments. A

rough form X card is prepared for each applicant for enlistment whether accepted or rejected. The cards are retained for ship or station files, and filed alphabetically according to surnames by calendar years. The smooth form X is prepared from the cards and forwarded from receiving ships, navy and marine corps recruiting stations, and marine corps recruit depots at the end of each quarter; from other stations, yards, or ships, at the end of the calendar year. The smooth form X is an abstract of enlistments.

◆

Military Hygiene School at Camp Greenleaf, Ga.—In a very interesting letter to the editor, Lieut. John Hall, M. R. C., writes as follows:

The School of Military Hygiene is a part of the Medical Officers' Training Camp here in Chickamauga Park. The School is under the direction of Major A. C. Abbott who, I believe, was at one time Health Commissioner of Philadelphia and has been in charge of biological and public health work in the University of Pennsylvania.

After several weeks' general training in the main camp, men are selected to take the course in this school for extra study in military disease prevention. We receive some instruction in camp sanitation, waste disposal, water and food supplies, and communicable diseases. Considerable attention is given to the so-called "paper work" of the Medical Department of the Army which includes reports, records, and other formalities, popularly known as "red tape." We are also expected to become familiar with the principles of Court Martial, U. S. Army Regulations, and Articles of War.

The Sanitary Corps, in which I am commissioned, has a number of its members represented here. They all appear to be non-medical men—specialists in various fields such as mosquito extermination, sanitary engineering, epidemiology, and psychology.

Beside the subjects of instruction previously mentioned, there are many lectures on surgery, physical examinations, and medical treatment of disease.

The military life here is in itself attractive and I believe, as such life goes, very comfortable. We have excellent food and good quarters and do not work very hard. The rather leisurely way in which this training is given and the emphasis which seems to be laid on theory and detail in some of our courses is probably an indication of the government's belief that this is to be a long war.

In all, this is an interesting and valuable experience and, besides preparing us to be soldiers to do our share in the constructive side of the war, it will make much better and broader-minded health officials and physicians who will have an even bigger work to do after the war is over.

EDITORIAL SECTION

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PROPOSED LEGISLATION CONCERNING THE UNITED STATES PUBLIC HEALTH SERVICE.

Attention has repeatedly been directed in these columns to the Public Health Reserve bill, which proposes to establish a reserve corps for the U. S. Public Health Service, similar to the Medical Reserve Corps of the Army. The last congress adjourned without passing the bill.

More recently it has been proposed to absorb the U. S. Public Health Service into the Army Medical Department during the period of the war.

Now we learn that a bill is to be introduced into Congress by the National Educational Association, the tentative draft of which bill contemplates the inclusion of the Public Health Service into a National Education Department. It is pointed out in a letter to the editor that this bill, if passed, would "hamper, if not defeat, the plan for a National Health Department."

Concerning the proposal to transfer the Public Health Service to the Army, Major V. C. Vaughan writes in a recent memorandum:

> "It must be recognized that in the preservation of the health of the nation, no sharp line can be drawn between civilians and soldiers. Civilians constitute the source of supply of soldiers, and soldiers are constantly mingling with and returning to the civilian population. The relation between these two bodies is one of fluidity and not solidity. Failure to see this and act accordingly may lead to disaster in both portions of our population. At present, civilians are constantly invading the camps in which the infection becomes intensified and is returned to the civilian population throughout the length and breadth of the country. The assembly of troops, whether it be by draft or by voluntary service, acts like a dragnet, bringing the widely scattered infections from city, village and farm, from every part of the compass and from every class and condition of citizenship. *The camp acts as an incubator in which the infections develop and through which they spread and increase in virulence.* Furloughed and discharged soldiers distribute the infection incubated and intensified in the

camps, and even those who are sent across the seas bear these infections to our troops in France. If we are to win this war with the least possible expenditure of life, we must control, or at least abate, the infection among our soldiers, and this cannot be done without attention to the abatement of communicable diseases among the people as a whole.

"Suppose we have an army of 3,000,000 men. At the same time, we have a civilian population of 97,000,000. These are indeed one population, mingling and mixing at all times; one being converted into the other and then returning to the original source. Common sense shows that it is not possible to stamp out disease among 3 per cent of our population while we neglect the source among 97 per cent.

"The health organization of the country, both National and State, extending down to the locality, should be and must be, if our troops are to be most effective, under one and the same control. With this in view, the following recommendations are offered:

"(1) The United States Public Health Service, with its personnel, functions, duties, properties including its hospitals, quarantine stations, etc., should be transferred to the Medical Department of the Army, and placed within the jurisdiction and under the command of the Surgeon-General of the Army during the continuance of the war.

"(2) If the above recommendation can be put into effect, the Surgeon-General of the Army should assign to duty in each State a medical officer whose function should be to coöperate with the State Health authorities in the control and abatement of communicable diseases among the entire population of the State, both civilian and military, both temporary and permanent residents.

"(3) In case the first recommendation be put into effect, the Surgeon-General of the Army should station at such points in each State as he may think wise, and we suggest in the proportion of one to 50,000 population, additional military health officers, who, under the direction of the State officer mentioned in number (2), shall coöperate with the local health authorities in their efforts to control and abate communicable diseases.

"Fortunately, the first recommendation is already legally provided for. Section IV of an Act of 1902 reads as follows:

"'That the President is authorized in his discretion to utilize the Public Health and Marine Hospital Service in times of threatened or actual war to such extent and in such manner as shall in his judgment promote the public interest, without, however, in any way impairing the efficiency of the service for the purpose for which the same was created and is maintained.'

"Under date of April 6th, 1917, the President promulgated an order in accordance with the above-mentioned provision in the law. It is only necessary for the Secretary of War to ask the Secretary of the Treasury to transfer, for the period of the war, the United States Public Health Service with all its functions, duties and properties, to the War Department.

"The practical working of these regulations should be something like the following:

"The local military health official should keep himself well posted on the communicable diseases in his district, and he should be vested with all authority necessary in the control of the same. He should have under his direct supervision and command, all new troops, both those volunteering and those drafted within his district. He should see that these men are not unnecessarily exposed to infection, and he should know to what infections and to what extent they have been exposed. From the time a young man is selected for the draft until he reaches the camp to which he is to be assigned, he should be under the direct charge, supervision and control of the local military health officer. When the squad from that vicinity is assembled, this official should either in person or by a deputy, conduct these soldiers to the camp to which they were assigned and turn them over to the medical officer of the camp with a full statement of all exposures to infection. When a soldier is furloughed from camp, he should be transferred to the command of the local health officer and should be under his charge, care and control during the whole of the time of his furlough. The local military health officers should make immediate telephonic or telegraphic reports to the State officer, and in case the military camp or cantonment is located in that State, directly to the Division Surgeon."

Attention is directed to the proposed bill of the National Educational Association in the following letter:

BUREAU OF MUNICIPAL RESEARCH
Training School for Public Service
261 Broadway
New York City

May 8, 1918.

To the Editor of the American Journal of Public Health.

Dear Sir: The Committee of the National Educational Association on the National Emergency and Education has prepared a tentative draft of a bill, the objects of which are briefly as follows:

To create a national Department of Education.

To appropriate money for the conduct of said Department.

To appropriate money for Federal aid to the states in the promotion of education.

The proposed bill presents certain features which are of vital interest to public health officers and to physicians generally. In brief, it contemplates the inclusion of the Bureau of Public Health Service of the Treasury Department under the proposed Department of Education. To those who have been interested and active in propaganda for a national Department of Health, this feature of the bill will have special interest since the passage of the bill in its present form would seriously hamper, if not actually defeat, the plan for a national Health Department.

It is urged that the tentative draft of this bill be carefully studied by public health agencies and medical societies, to the end that the framers of the bill may receive the advice of those best understanding public health needs. Copies of the bill may be secured from Superintendent J. A. C. Chandler, Richmond, Va., chairman of the committee which prepared the bill.

The Bureau of Municipal Research, which the writer represents, is desirous of securing competent opinion from physicians and public health authorities on the proposals of the bill and will be pleased to receive suggestions and comment from readers of the American Journal of Public Health.

Yours very truly,

Dr. Carl E. McCombs.

THE HEALTH PROBLEMS OF THE CIVIL POPULATION.

The meeting of the American Public Health Association at Chicago, October 14 to 17, 1918, promises to be one of peculiar national importance. Last year, as was fitting, we considered the immediate problems of military hygiene and sanitation created by the war. During the past twelve months it has become increasingly clear that the care of the health of our soldiers in the field is but a part of a much larger task imposed upon the medical and sanitary forces of the nation.

The sanitation of cantonment zones has broadened to include far-reaching plans for health reorganization in adjacent civilian communities. The protection of the soldier and the sailor from venereal disease has been found to involve the whole problem of social hygiene in the cities and the towns from which the recruits are drawn and to which they return on leave. The care of the tuberculous soldier and of the soldier afflicted with mental disease, as well as the increase of both types of disorder in their families which will inevitably result from war conditions, call for a broadly conceived expansion of our medical and educational and social service facilities for dealing with these problems. The supervision of hygienic and sanitary conditions surrounding munitions and shipyard workers, in which the U. S. Public Health Service is now taking an active part, requires vigorous and aggressive efforts. Finally the new value placed on human life by the world war justifies to the full the stirring summons of the Children's Bureau to a campaign for the saving of 100,000 infant lives.

To these tasks the public health workers of the country dedicate themselves anew in this critical year of the war; and the annual meeting of the Association will be so planned as to be of the most direct service to them in the fulfilment of their duty.

C.-E. A. W.

THE CHAMBERLAIN BILL AND VENEREAL DISEASE.

This bill, which was introduced into the House and Senate on May 25, provides for an Interdepartmental Social Hygiene Board representing the War, Navy and Treasury Departments. Its purpose is to protect the military and naval forces against venereal disease "and for other purposes."

The War and Navy Departments are directed to assist the States in isolating those infected with venereal disease.

A Division of Venereal Disease of the United States Public Health Service is created for research work, coöperation with State Health Departments, and controlling spread of venereal disease in interstate traffic.

A million is appropriated to the War and Navy Departments jointly. Another million is provided for distribution by the Treasury Department upon a population basis among the State Health Departments of such States as appropriate amounts equalling their respective quotas and $400,000 is provided for research in institutions of learning under the supervision of the Secretary of the Treasury. Finally, $200,000 is provided for the United States Public Health Service for the expenses of the new Division.

The bill was endorsed by the Conference of State and Provincial Boards of Health at Washington, June 6, 1918, and deserves the support of all sanitarians.

A JOURNAL OF THE PLAGUE YEAR WRITTEN BY A CITIZEN WHO CONTINUED ALL THE WHILE IN LONDON.*

By Daniel Defoe.

Published on the 17th of March 1722, "A Journal of the Plague Year: being observations or memorials of the most remarkable occurrences, as well public as private, which happened in London during the last great visitation in 1665. Written by a citizen who continued all the while in London. Never made public before."

I lived without Aldgate, about midway between Aldgate Church and Whitechapel Bars, on the left hand or north side of the street; and as the distemper had not reached that side of the city, our neighborhood continued very easy. But at the other end of the town their consternation was very great; and the richer sort of people, especially the nobility and gentry from the west part of the city, thronged out of town with their families and servants in an unusual manner; and this was more particularly seen in Whitechapel; that is to say, the Broad Street where I lived; indeed, nothing was to be seen but wagons and carts, with goods, women, servants, children, etc.; coaches filled with people of the better sort, and horsemen attending them, and all hurrying away. . . .

This was a very terrible and melancholy thing to see, and as it was a sight which I could not but look on from morning to night, for indeed there was nothing else of moment to be seen, it filled me with very serious thoughts of the misery that was coming upon the city, and the unhappy condition of those that would be left in it.

While the fears of the people were young, they were increased strangely by several odd accidents, which put altogether, it was really a wonder the whole body of the people did not rise as one man and abandon their dwellings, leaving the place as a space of ground designed by Heaven as an Acel-dama, doomed to be destroyed from the face of the earth, and that all that would be found in it would perish with it. . . .

In the first place a blazing star or comet appeared for several months before the plague, as there did the year after another, a little before the fire. . . .

One time before the plague was begun (otherwise than as I have said at St. Giles's) I think it was in March, seeing a crowd of people in the street, I joined with them to satisfy my curiosity, and found them all staring up into the air to see what a woman told them appeared plain to her, which was an angel clothed in white with a fiery sword in his hand, waving it or brandishing it over his head. . . .

It is true when the infection came to such a height as I have now mentioned, there were very few physicians who cared to stir abroad to sick houses, and very many of the most eminent of the faculty were dead, as well as the surgeons also; for now it was indeed a dismal time, and for about a month together, not taking notice of the bills of mortality, I believe there did not die less than 1500 or 1700 a day, one day with another.

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*This is the first of a series of extracts from the classics to be selected by Professor C. M. Hilliard of Simmons College.—Editor.

One of the worst days we had in the whole time, as I thought was in the beginning of September, when, indeed, good people began to think that God was resolved to make a full end of the people in this miserable city. This was at that time when the plague was fully come into the eastern parishes. The parish of Aldgate, if I may give my opinion, buried above a thousand a week for two weeks, though the bills did not say so many,—but it surrounded me at so dismal a rate that there was not a house in twenty uninfected in the Minories, in Houndsditch, and in those parts of Aldgate parish about the Butcher Row and the alleys over against me. I say in those places death reigned in every corner. Whitechapel parish was in the same condition, and though much less than the parish I lived in, yet buried near 600 a week by the bills, and in my opinion twice as many. Whole families, and indeed whole streets of families, were swept away together; insomuch that it was frequent for neighbors to call to the bellman to go to such-and-such houses and fetch out the people, for that they were all dead.

And, indeed, the work of removing the dead bodies by carts was now grown so very odious and dangerous that it was complained of that the bearers did not take care to clear such houses where all the inhabitants were dead, but that sometimes the bodies lay several days unburied, till the neighboring families were offended with the stench, and consequently infected; and this neglect of the officers was such that the churchwardens and constables were summoned to look after it, and even the justices of the Hamlets were obliged to venture their lives among them to quicken and encourage them, for innumerable of the bearers died of the distemper, infected by the bodies they were obliged to come so near. . . .

I am now come, as I have said, to the month of September, which was the most dreadful of its kind, I believe, that ever London saw; for, by all the accounts which I have seen of the preceding visitations which have been in London, nothing has been like it, the number in the weekly bill amounting to almost 40,000 from the 22nd of August to the 26th of September, being but five weeks. . . .

Upon the foot of all these observations I must say, that though Providence seemed to direct my conduct to be otherwise, yet it is my opinion, and I must leave it as a prescription, viz., that the best physic against the plague is to run away from it. I know people encourage themselves by saying God is able to keep us in the midst of danger, and able to overtake us when we think ourselves out of danger; and this kept thousands in the town, whose carcasses went into the great pits by cartloads, and who, if they had fled from the danger, had, I believe, been safe from the disaster; at least 'tis probable they had been safe.

A dreadful plague in London was
  In the year sixty-five,
Which swept an hundred thousand souls
  Away; yet I alive!

STORIES FROM THE DAY'S WORK

Contributions to this section are invited.—*Editor.*

VACCINATION VS. PRAYER.

A decade or more ago we had in our city a religious sect known as Dowieites. They were followers of Dowie, a man who reviled doctors and threw the burden of preventing and curing disease upon the Lord.

His doctrine in part was reasonable inasmuch as he recognized such a thing as disease and that it was the result of sin. He enforced right living and of course got good results. He would make a whiskey-soaked tobacco chewer get on his knees and pray about a quarter of the time. The man would quit his vile habits and secure health, and for this beneficent service Dowie took only one tenth of the sinner's income for the rest of his natural life.

Dowie regarded all sickness as sin and therefore evil. He would not choose the lesser of two evils. He admitted that vaccination was a lesser evil than smallpox, but prohibited vaccination on the ground that it was an evil and all evil must be shunned. This was given as his reason for his opposition to vaccination. He probably had other reasons which, when analyzed, smacked of commercialism.

Dowie conducted a college on Michigan Avenue in which was taught his peculiar brand of religion and some other things. He had 270 students. One of them had the impudence to take on smallpox when he had been taught that such a thing was not possible. This student was in a room with three other students of Dowieism. I examined the three and found one had a good scar from a vaccination made in childhood. I told him he would probably escape smallpox, though his vaccination was pretty old. The other two had never been vaccinated. I promptly told them they would both have smallpox and be in the hospital within fourteen days. They had already been exposed several days. I was informed by them it would be impossible for them to have the disease as they were in constant prayer. Of course they refused vaccination. I told them to pray harder and oftener, but it was certain they would be sick within twelve days. I told the vaccinated one that he was in less need of prayer than the other two as I thought he was protected against smallpox. No vaccinations were permitted among the students. All were quarantined in the college which was largely a dormitory where the students lived. I examined all arms and found but 53 out of 270 without a vaccination. They were held under quarantine a month as eight cases developed making two fifteen-day periods of isolation. Only a few of the students were exposed to the disease as the first case was at one end of the building and not much visited. I visited those directly exposed (the room-mates of the patient) every day. They were faithfully praying and told me with glee that they had escaped. I told them what day they would experience a chill, headache and fever. I told the vaccinated one he would undoubtedly escape the disease. The morning of the day I had predicted the invasion of smallpox symptoms, I called and the two unvaccinated ones did not appear cheerful. They were so sick they could not deny the fact. They admitted that they were suffering and unable to sit up. I sent them to the hospital. The one with the old vaccination escaped the disease as I had predicted he would.

Did these people learn anything from this experience? They did not. They are still opposed to vaccination because it is an evil—and they must shun all evil.

Heman Spalding, M. D.,
Chief, Bureau of Medical Inspection,
Department of Health, Chicago.

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A DIPHTHERIA MYSTERY.

While I was bacteriologist in a small city, about fifteen of positive throat swabs trickled into the laboratory, one or two a day, over a period of ten days. Nearly all of the cases were under the age of six, which at once threw suspicion upon the milk. A trip to the homes showed that the majority of householders affected patronized one milk dealer, who operated five wagons, serving about fifteen hundred customers.

Here was a puzzling situation, for if this milk was the source of the disease why didn't we have hundreds of cases instead of fifteen, and why didn't the cases break out in one great explosion when the milk was infected instead of popping up sporadically? To make matters more interesting, the chairman of the board of health insisted that there wasn't any diphtheria. He was school physician, and hadn't found a case of diphtheria.

The mystery was complete when I examined throats at the dairy and found that the milk was being pasteurized, and that there wasn't a sore throat in the place. However, I took swabs from all the milk handlers, and found a healthy carrier. His throat was clear but his nose was badly infected.

We quarantined him, and the epidemic stopped short.

But how did the man infect over ten days a milk supply reaching hundreds of families so as to cause only fifteen cases?

He didn't infect the milk supply at all! He infected the lip and outer neck of the bottle. Part of his job was to examine the bottle for cracks. He chewed tobacco, probably wiped his mouth with his hand, lifted a bottle by the neck, and infected it. The careless mother who failed to wash the bottle, poured the bacteria into the pitcher with the milk.

A. W. Hedrich.

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AID TO INCREASE APPROPRIATIONS.

When the annual budget for the Palo Alto (California) Health Department, for the fiscal year 1915–16, was prepared, it included a considerable increase in both salary and expense items. The appropriation asked represented an expenditure for health of about 60 cents per capita per annum.

Just before the adoption of the annual municipal budget, of which this was a part, one of the councilmen sent out a written statement charging that the Health Department expenses were extravagant for a city of that size (5,500), and citing the very much smaller health expenditures of seven other California cities of about the same population. He urged that the expense be cut in half.

Several councilmen requested that I prepare immediately a statement of facts and figures to meet the statements of the opposing councilman. Less than forty-eight hours were available, but in that time the death records of the seven cities were analyzed, and reduced to diagrams showing the total death-rate, and the death-rate from preventable causes. One diagram showed the total death-rate of Palo Alto and the seven cities compared for the previous ten years.

The diagrams were blueprinted, and the blueprints, together with brief written descriptive matter, and a tabular statement of appropriations and expenditures for the past five years, were neatly bound in a folder, and were given to each councilman just ten minutes previous to the meeting.

The comparison was so obviously to the advantage of Palo Alto that the objecting councilman, realizing there was no hope of decreasing the appropriation, merely moved to strike out the increase, which was voted down by a vote of 12 to 3; the increased budget was adopted with but one dissenting vote.

Health officers should make more use of brief graphical methods of presenting their arguments for appropriations. They will find it pays, and will often surprise an increase out of the city fathers. They like to be shown.

Harold F. Gray,
District Health Officer,
Chico, Calif.

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KEEPING THE VOTER HAPPY.

In a small town where the continuance of full time health work is subject to vote each year at the annual town meeting and where a great many of the voters are men situated away from the center of the village on farms the health officer faces the problem of letting these men know what the department is doing and of gaining their good will. The farms upon which these men live constitute a sanitary unit by themselves. People who drink water from a well that has been in use for generations and use the privy of their forefathers are apt to be a bit conservative when it comes to spending money for modern health work.

This was the situation that faced the Health Department at York, Maine. After a consideration of the problem it was decided to send a letter signed by the health officer to every voter in town. This letter was made as personal as possible and, in addition to calling attention to the accomplishments of the department during the previous year, it was made plain that we were there to serve them and were willing and anxious to do so. We would be glad to analyze their milk for them to determine which were their profitable cows; if they were thinking of building a new cow barn we would welcome the opportunity to get the most modern and approved plans for them and assist them in any way possible. They were invited to visit the laboratory whenever they were in the village and we would to explain to them how we did things.

A week after these letters were sent out I received a letter from a man living five or six miles out in the country and he thanked me for my kindness in writing him and for the invitation to visit the laboratory. He also gave me some valuable information about some lumber camps situated on the water shed which enabled us to do away with a potential source of typhoid fever. The department was continued.

Aaron P. Pratt, C. P. H.,
Formerly Health Officer,
York, Maine.

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CLEANING UP THE NEGRO SECTION.

The Durham County and City Health Department was organized May, 1913. The greater part of the first year's work was spent in organizing and getting information on the work to be done. As the U. S. Bureau of Census in 1910 gave the city of Durham a colored population of 6,869 and a death-rate of 26 per 1,000, special attention was given to investigating the cause of the high death-rate among the colored people. Many things were found. It was decided that educational work should be pushed, and a special colored visiting nurse was employed for the work. Leaflets and other printed matter on health were distributed in their homes; health lectures were given in their schools and churches; and house to house visits were made by the nurse instructing them in health and sanitary matters.

In 1915 the colored death-rate was 23. In June, 1916, our educational work looked as if it were having effect, and would give results. A meeting of the representative colored men was called to meet with a committee of white ladies from the Civic League and a committee from the Health Department. The necessity of some means of caring for the tuberculous Negroes was presented to them. The colored people responded with a seven room annex to their hospital (10 beds), the Civic League supplying the furniture and equipment, and the Health Department contributing $50 per month toward the running expenses. In less than forty days the whole scheme was carried through and the hospital doors were opened to receive patients. In 1916 our colored population, estimated by U. S. Bureau of Census, was 9,714. Our colored death-rate had dropped from 23 to 18.11 per 1,000.

April 21 to 28, 1917, was observed as annual health and clean-up week. The following committees were organized into a coöperative campaign: the Colored Business Men's League, the Colored Mother's Club, the Ladies' Board of the Lincoln Hospital, the Faculty and Children of the Graded School, the colored insurance companies, the colored physicians and nurses, and the Health Department. Sunday prior to the campaign the pastors of the colored churches preached special sermons on cleanliness and health. Great impetus was given to the work by their sermons. The week prior to clean-up week, six public meetings were held at which the city colored nurse made daily reports of inspections and progress of the work. These meetings were well attended, the program consisting of patriotic music, short talks by leading colored business men, physicians, teachers and nurses. Moving pictures and lantern slides were also used to impress upon the masses the dangers resulting from flies, mosquitoes, etc. The city was divided into four sections, and the colored homes visited and urged to clean up. To encourage beautifying their homes, flower seed was distributed at the schools to the children. Lime stations were located at convenient places where the colored people could apply and get lime free for white-wash and other purposes. Thirty-one barrels were distributed through these stations. The results were that practically all outhouses, fences, trees and telephone poles in the vicinity of their homes received a coat of white-wash. The main thorough-fare running through the colored district was spoken of as "The Great White Way." Many of the houses were freshly painted inside and out as a result of this campaign. The visiting committee found that more than 2,000 homes had been cleaned and otherwise greatly improved, and the people were proud of their work.

I am expecting another drop in our colored death-rate for this year. I believe that if any material reduction in the death-rate of our southern states is made it will be through work done with the colored people. I am glad to say that the North Carolina State Board of Health has a number of colored workers in the field.

A. Cheatham, M. D.,
Health Officer,
Durham, N. C.

ASSOCIATION NEWS

By the Secretary, A. W. Hedrich.

A meeting of the Council of the Food and Drugs Section of the American Public Health Association was held recently in New York City, for consideration of business relating to the Section.

Dr. Arthur J. Cramp was elected chairman of the Committee on Drugs and Nostrums, in place of John Phillips Street, resigned.

Dr. Herbert D. Pease was made a member of the Committee on Conservation and Development of Food Supplies.

Vacancies on the Committee on Control of Milk and Dairy Products were filled by appointing Joseph Race and Dr. Harry W. Redfield.

Features for the program of the next meeting of the Section were discussed, and as a result an attempt will be made to lay special emphasis on the application of the laws of nutrition to household economics; the bringing of the truths as to the necessity for and benefits from cold storage to the attention of the consumer; and consideration of all phases of the subject of garbage disposal and utilization. *J. O. Jordan.*

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HELP WANTED.

In order to help relieve the shortage of santarians due to the war, free help wanted announcements will be carried in this column until further notice. Copy goes to the printer on the first of each month.

In answering keyed advertisements, please mail replies separately.

The Health Employment Bureau also sends lists of applicants to prospective employers without charge.

A full-time medical health officer is wanted in a city in Illinois. Must acquire medical license in Illinois. Salary, $3,000 per year. Address D. S. C., No. 135, care of this Journal.

A health officer and city physician is wanted in the Middle West. Salary, $3,000. Address S. A. M., No. 136, care of this Journal.

First-class sanitary engineer, who can handle laboratory end of water examinations, is wanted by a Nebraska Health Department. Salary, $2,000. Address W. F. W., No. 137, care of this Journal.

A bacteriologist is needed in a Nebraska Health Department. Salary, $2,400 per year. Address W. F. W., No. 137, care of this Journal.

Several men are wanted during the summer for anti-malaria field work. Third and fourth year students in sanitary engineering, bacteriology, or allied sciences are desired as inspectors of mosquito breeding places near Norfolk. Salaries range from $3.60 per day to $165 per month. Address H. V. W. H., No. 138, care of this Journal.

A chemist and bacteriologist is wanted in Illinois Must be qualified to make chemical and bacteriological examinations of water, milk, sewage, and of pathological specimens. Salary, $2,000 per annum. Address D. S. C., No. 139, care of this Journal.

A city in Illinois wants a high-grade sanitary engineer to act as chief of Division of Sanitary Engineering. Salary, $3,600 per annum. Address D. S. C., No. 140, care of this Journal.

The Sanitary Corps of the United States Army needs graduate sanitary engineers of at least three years' practical experience in public health work. Operators for water and sewage purification plants are also needed for duty in this country and abroad. These should be men preferably over draft age or those who are rejected for physical defects. Send applications to Lt. Col. William Wrightson, Surgeon General's Office, War Department, Washington, D. C.

A government bureau requires the services of a medical man for the purpose of preparing reviews of medical literature. Salary, $2,500. Address W. F. B., No. 141, care of this JOURNAL.

The State of West Virginia requires a director of the public health laboratory. Beginning salary, $2,500 to $3,000. Address J. L. S., No. 142, care of this JOURNAL.

PERSONAL NOTES.

Dr. R. K. McClanahan succeeds Dr. W. E. Kaser as secretary of the New Mexico State Board of Health.

Captain Millard Knowlton has been ordered to Topeka, Kan., for duty as epidemiologist in charge of venereal disease work.

Dr. R. W. Garnett has resigned his position as whole-time health officer of Fauquier County, Virginia, to accept a place with the State Board of Health of Virginia. He will have charge of the medical inspection and epidemiological work.

Dr. S. A. Munford, of Ithaca, N. Y., has been commissioned captain in the Medical Reserve Corps.

Mr. Harry Y. Carson, formerly with the Central Foundry Company of New York City, is with the Palestine Red Cross Relief Expedition.

Mr. Gustave R. Tuska of New York City has been commissioned as major in the Engineers Corps.

Dr. Guilford H. Sumner of Des Moines, Iowa, has been reappointed as secretary-executive officer and state health commissioner of Iowa. His new term begins July 1, 1918, and ends July 1, 1923. Dr. Sumner has already served eight and one-half years as commissioner and secretary of the State Department of Health.

Dr. Vernon Robins of Montgomery, Ala., has accepted the position of head of laboratories at the Health Department of Louisville, Ky.

Mr. J. J. Weber of New York City has taken the position of assistant director of the Boston Dispensary and eastern representative of the *Modern Hospital.*

Mrs. B. A. Haasis, formerly Miss Bessie Ely Amerman, has been made educational secretary of the National Organization for Public Health Nursing.

Dr. Arthur Lederer has resigned as director of the Hygienic Laboratory of West Virginia, and has accepted a position with the Hygienic Laboratory, U. S. P. H. S.

Dr. C. F. Boldman has resigned as director of Public Health Education at New York City Health Department.

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The following were elected to membership in the Association during May, 1918:

Corporate Members:

The Columbian National Life Insurance Co., Boston, Mass.

The Mutual Life Insurance Co. of New York, New York City.

The Travelers Insurance Co., Hartford, Conn.

Individual Memberships:

Charles A. Hunter, State College, Pa., Bacteriologist, Pa. State College.

Kenneth R. Glennan, M. D., U. S. Public Health Service, Houston, Tex.

Garabod S. Ghazarian, M. D., Providence, R. I.

Edwina M. MacDougall, B. S., Whitewater, Wis.

Charles R. Carraway, M. D., Laurel, Miss.

Bernard Kohn, M. D., Philadelphia, Pa., Medical Inspection Public Schools.

J. G. Saam, M. D., Eveleth, Minn., City Health Commissioner.

T. W. Margerum, Princeton, N. J., Health Officer.

Josse M. Worthen, M. D., Midland Park, S. C.

John S. Hibben, M. D., Pasadena, Cal.

John E. Dowd, Brooklyn, N. Y., Chemist, Mt. Prospect Laboratory.

L. A. Cornelius, Grand Rapids, Mich., Designer of Plumbing Goods.

Cecil K. Maxwell, M. D., Kellyton, Ala., Health Officer.

James Krom, M. D., Saugerties, N. Y.

BOOKS AND REPORTS REVIEWED

Social Diagnosis. *Mary E. Richmond. New York: Russell Sage Foundation. 511 pp.*

During recent years progressive social workers have been eagerly anticipating the publication of the results of Miss Richmond's varied experiences and studies and it is not surprising that her work has immediately become a classic. A knowledge and mastery of social diagnosis clearly constitutes a part of the equipment of every social practitioner, and ignorance is inexcusable since Miss Richmond has set the subject forth in so clear and convincing a manner.

The significance of the book to the public health man needs, however, to be pointed out. He knows probably that there is as great a distance between the ancient dole and the modern system of relieving persons in distress, as there is between fetishism and modern hygiene, but he does not always realize how closely akin the problems of the social worker are to those of the hygienist. He will therefore learn with interest the extent to which public health agencies are used by agencies doing work with children, family work and medical-social work, as, for instance, in 2,800 cases studied, 1,828 medical sources were consulted as against 743 work sources. He will immediately agree with the writer that the non-medical worker should never atempt to make a medical diagnosis, but he should be more impressed with her arraignment of the non-social attitude of many practitioners, the frequency of conflicting diagnoses and prognoses and failures in keeping correct medical records. The claim that both groups of public servants—the social and the medical—will serve the public best when they have thoroughly mastered the technique of working together implies a new spirit on the part of many public health officials. Miss Richmond points out that "with the new interest in public health and the developments of public health departments of the modern type, there should be many ways in which the non-medical social agencies and these departments can be of service to one another." She gives in illustration a brief description of the services rendered the New York Charity Organization Society by the city's Health Department.

The increasing emphasis placed on the social value of their work by public health officers will bring speedier returns when the principles of social diagnosis are more clearly understood by them and more sympathetically applied. Miss Richmond's book should be of universal service in bringing about more effective coöperation between the two great groups of public agencies.

Marion Talbot.

The University of Chicago.

Animal Parasites and Human Disease. *Asa C. Chandler, M. S., Ph. D., Instructor in Zoölogy, Oregon Agricultural College, Corvallis, Oregon. John Wiley & Sons, Inc., London: Chapman & Hall, Ltd., 1918. Pp. 570+XIII. Price, $4.50 net.*

It is the aim of this volume to present the important facts of parasitology, as related to human disease, in such a manner as to make it readable and useful not primarily to the parasitologist, but to the public health and immigration service officers; to the physicians who are concerned with something more than their local practice; to teachers of hygiene, domestic science, or other subjects in which health and preventive medicine are important; to college and high school students; to the traveler; and to the farmer or merchant who is interested in the progress of science and civilization. This object has been accomplished, but the author has evidently had frequent difficulty in translating technical subjects into lay language.

Chandler believes that the crying need of the present time is not so much additions to our knowledge of the cause, control and prevention of diseases, much as this is to be hoped for, as it is the efficient application of what we already know. He states that "Popular ignorance of diseases, even such common ones as malaria and syphilis, is nothing short of appalling. This ignorance is by no means confined to the poorly educated masses; it is wide-spread among educated, college-bred people, and piteous as it may seem, is characteristic of many professional men, among them even physicians of good reputation."

Emphasis is placed upon the importance of the subject, and the wide-spread distribution of the parasitic diseases of man. It is plain that with modern facilities for communication and with the extent of foreign immigration at the present time, there is no part of the world so remote that the things which affect it may not also affect any other part of the world if conditions are suitable.

The book deals in an interesting manner with the protozoa, worms and arthropods, and also the diseases they induce. Questions of treatment, prevention, and sanitation are discussed. The text is clear, and contains few inaccuracies. In the historic introduction, one misses mention of the pioneer work of Theobold Smith. The book is well printed and edited and effectively illustrated. It should serve a useful purpose.

M. J. Rosenan, M. D.

Dietotherapy. *By William E. Fitch and forty collaborators. D. Appleton and Company. New York and London. 1918. Three volumes, 816, 798, and 929 pages. Price,* $21.00 *net (by subscription only).*

This is an encyclopedic work in which every conceivable aspect of food and nutrition receives extended attention. The first volume deals with the chemistry and sources of food, the second with the physiology of nutrition in health, and the third with the special problems of disease. There is inevitably a wide difference between the spirit of the treatment in one part and another. Sometimes the presentation is popular and entertaining, elsewhere it is more rigorously scientific. The chief place for such a set of books would seem to be in the reference departments of public libraries.

When a work so large and costly as this is produced it is proper to judge it by exacting standards. It should be so good as to leave no excuse for a competitor. It seems to the reviewer that this level of merit is not attained. Without reflecting upon the able collaborators it may be permissible to express regret that some of the foremost exponents of these subjects have not been induced to contribute. McCollum, Forbes, Lusk, Mendel, Osborne, Underhill, Taylor, Sherman, Folin, F. G. Benedict, Joslin and others readily come to mind. It is true that the studies of these men receive due notice but it is a pity that we have not their direct testimony. The bibliography is not always well developed. (For example, there are no references on tea and coffee more recent than 1901.) There are many misprints which are particularly unfortunate when proper names are involved. The tables in the section on Mineral Constituents are unintelligible. The work has so much value that its defects are the more distressing.

P. G. Stiles.

Tested Menus and Recipes. *Annie L. Weeks. University of Rochester and Mechanics Institute, 1717. 19 pp. 10 cents.*

This bulletin is a demonstration that attractive and palatable menus can be planned from a low cost dietary. Menus for an entire week are given for different types of families. In addition to a number of American recipes, some useful Italian, Polish, English, German and Syrian recipes are also given.

D. Greenberg.

The Rockefeller Foundation. A Review of Its War Work, Public Health Activities and Medical Education Projects in the Year 1917. *G. E. Vincent, President of the Foundation. New York, 1917. Pp. 47.*

Of the many projects and activities which are being carried on, the Foundation is devoting by far the largest part of its available resources to the support of war work. Some of the specific activities carried on are (1) the War Hospital equipped for the demonstration of the technique of the Carrel-Dakin treatment, (2) the preparation and distribution of sera for combating meningitis, and pneumonia, (3) aiding the Government in carrying out its mental hygiene program, (4) antituberculosis work in France, (5) the establishment of a School of Hygiene and Public Health, (6) campaign against hookworm, which extends to twenty-five foreign countries and twelve American states, and (7) maintenance of medical schools in China.

D. Greenberg.

PUBLIC HEALTH LABORATORY NOTES

Abstracts by Arthur Lederer, M. D.

Superiority of Inoculations with Mixed Triple Vaccine.—The author carried out a series of inoculations in a number of men and rabbits with vaccines prepared from cultures of two or all three of the bacilli (B. typh., B. paratyph. A and B, paratyph. B), varying the order of their introduction in the successive immunizations of different groups of rabbits. The details of all the experiments are given in full and the results are discussed. When a mixed vaccine is used the immunity obtained for each of its constituent bacilli is at least as good as, and very often greater than, that obtained against any of these organisms when it is employed alone in the same dosage for a first immunization. When single vaccines are employed in succession and the immunizations are carried out independently, the response is greatest to that vaccine which is introduced first. To the later immunizations with other microörganisms the specific response is almost always less intense. It has associated with it, however, as a secondary result the production of a new rise of variable extent in the agglutinin titer of the serum of the bacillus of the first immunization.—W. C. Davison, *Arch. Int. Med.*, 21, 437 (1918).

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Ascending Cultures of Bacteria.—Certain bacteria possess the faculty of climbing to the surface of the tube of agar when only the condensation fluid of the bottom of the tube was inoculated. Bacteria can be classed by this phenomenon as climbing and non-climbing, and this supplies another element for differentiating them. It is the most convenient and the most certain method for distinguishing the proteus, and obtaining it in pure cultures. The bacteria of the typhoid group and certain races of colon bacteria are of the ascending type.—C. Gorini, *Policlinico*, 25, 173 (1918).

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A Bacteriological Method Useful for the Study of other Microörganisms.—Description of a method of growing bacteria in a thin film of medium upon a microscopic slide and later stained It is valuable for the rapid determination of the number of organisms in any richly seeded material, and also for the study of the morphology of the single cells or of the colonies.—F. M. Bachmann, *Am. Jour. Botany*, 5, 32 (1918); *Chem. Abst.*, 12, 812 (1918).

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Ameba Found in Trench Fever.—Triudin is convinced that the infectious disease he describes, known as "trench fever," is a disease *sui generis.* Also that the ameba he found in the blood stands in some casual relation to it. He found the protozoon in 75 per cent of his twenty-four cases, but exclusively during the first three days of the disease. The blood showed the characteristics of a severe blood disease. Coagulation was retarded; in some it began at the tenth minute, in others not until the twenty-third. The average was eighteen minutes.—P. N. Triudin, *Russkiy Vrach, Petrograd*, 16, 566; *Jour. Am. Med. Assn.*, 70, 1271 (1918).

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Bacteriology and Immune Reactions of Rubeola and Rubella.—Diplococci may be isolated from the blood of patients with rubeola and rubella. While the two organisms are similar in their cultural characteristics they differ in size, shape, capsule, formation, filtrability, viability, virulency, and immunity reactions.—Ruth Tunnicliff, *Jour. Infect. Dis.*, 22, 462 (1918).

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Are All the Bacilli Found in the Sputum Virulent?—The investigations have revealed that in the majority of open cases of pulmonary tuberculosis, the tubercle bacilli which could be isolated on artificial mediums from the sputum were virulent enough to produce systematic tuberculosis in guinea-pigs, by means of doses as small as 0.000,001 mg.; and that the range of variation of virulence was very small, as was also pointed out by Gilbert and Gregg, who found it to lie between 10 and 120 bacilli. If the virulence of the bacilli as cultivated on artificial mediums is a direct expression of their virulence in the sputum, there is only one conclusion to be drawn from the foregoing findings, as viewed from a practical standpoint, and that is, that in open cases of pulmonary tuberculosis the tubercle bacilli discharged by droplet or by expectoration when still uninfluenced by drying and light, are a danger to mankind, through direct transmission at least. It seems justifiable to conclude that the tubercle bacilli found in the sputum of patients in open cases of pulmonary tuberculosis (provided the bacilli capable of artificial cultivation are a true index of those existing in the native sputum) vary only slightly in virulence for guinea-pigs, and are for practical purposes nearly all pathogenic.—H. J. Corper, *Jour. Am. Med. Assn.*, 70, 1281 (1918).

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Vaccine in Prevention of Whooping-Cough.—At the Children's Home in Schenectady, one of the forty-six inmates developed whooping-cough on or about November 27, 1917, but because of failure of diagnosis was allowed to mingle for nearly a week with other children, after which he was isolated in a separate building. It was later learned that during this time he was known to have whooped and vomited. An epidemic of the disease was well under way in the city at the time, and several of the whooping-cough patients had been attending the school to which the children of the home were sent daily. Seven weeks after the development of the case, there were nearly 400 records of pertussis at the city health department. December 3, 1917, 31 who gave no record of having had whooping-cough were inoculated, each with 50 million plain pertussis vaccine (stock). No reactions were noted, but one child complained of a sore arm. Up to the present time (January 24, 1918) not a single case has developed in the home. The original case was given one dose of vaccine immediately after the diagnosis was made and ceased whooping at the end of one week. The vaccine was not repeated.—F. Vander Bogert, *Am. Jour. Dis. Children*, 15, 271 (1918).

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Laboratory Diagnosis of Spirochete Jaundice.—The authors found in 102 men with infective jaundice that the spirochetes were present in the urine in largest numbers between the fifteenth and twentieth day, although in the severe cases the urine contained spirochetes during the

jaundice phase. They persist long in the urine; some few were found as late as the thirty-fifth and forty-fourth days. The spirochetes are very fragile and disappear from the urine as it ferments. By adding to the urine in the vessel in which it is collected 5 per cent of a 40 per cent solution of formaldehyde the urine is prevented from fermenting while the spirochetes are fixed at the same time. Centrifugation can be dispensed with by using the ligroin method to collect the spirochetes in the upper part of a test tube. The preferable staining technic seems to be with silver preceded with tannin, followed by thorough rinsing, with care not to allow boiling on the slide—the usual Fontana and Tribondeau technic. Besides the spirochete that seemed to the specific one, Vincent's spirillum was numerous.—P. Pagniez, A. Cayrel, P. P. Levy and J. de Leobardy, *Bull. de la Soc. Med. des Hop.*, Paris, 42, 31 (1918).

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Tuberculosis and Blastomycosis.—The lungs of tuberculous cattle constantly contain blastomycetes and other fungi. Among the blastomycetes are some species pathogenic for laboratory animals and fowls, and in shape and cultures not distinguishable from the Saccharomyces Neoformans. Associated with tubercle bacilli, animals inoculated died more rapidly than the controls inoculated with the tubercle bacilli alone, and the tissues show both diffuse tuberculosis and blastomycosis.—F. Sanfelice, *Annali d'Igiene, Rome*, 28, 41 (1918); *Jour. Am. Med. Assn.*, 70, 1267 (1918).

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Glanders in Felines.—The author found signs of acute glanders in the lungs of a tiger dying in captivity at Rome, and others have reported similar findings in lions and cats. The zoölogical gardens at Rome recently had an epizootic of acute glanders among the lions and tigers but the other animals escaped. Twelve of the large felines were affected and a number died. Cats inoculated from them developed the same set of symptoms in from three to five days, while other cats infected naturally from these cats showed an incubation period of six or seven days. The temperature, however, ran up the end of the fourth day.—M. Carpano, *Annali d'Igiene, Rome*, 28, 68 (1918); *Jour. Am. Med. Assn.*, 70, 1267 (1918).

Economy in the Colloidal Gold Test.—The colloidal gold solution which was formerly purchased by the Buffalo Health Department at $8 per liter can now be prepared for 5 cents per liter and a more satisfactory product obtained. The technique for preparation:

"A liter beaker should be rinsed out with triply distilled water and then filled to the mark with triply distilled water, and after the temperature has reached 50° C. the gas flame is increased. At 60° C., 10 cc. of 1 per cent gold solution and 7 cc. of 2 per cent potassium carbonate solution are added. The solution should remain perfectly clear. At 80° C., while stirring with thermometer, 10 drops of 1 per cent oxalic solution are added. At 90° C. the flame is withdrawn and 5 cc. of (1–40) formaldehyde solution slowly added, a drop at a time. If a pink color makes its appearance before all the reducing agent has been added, stop at once, for reduction will continue to the final end point, which is marked by the production of a brilliant, clear orange-red solution. Best solutions are those in which color changes develop slowly."—*Buffalo Sanitary Bulletin*, March 31, 1918. (*D. G.*)

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Skin Infection Due to Bacillus Mucosus-Capsulatus.—A peculiar ulcerative lesion of the skin following a suprapubic prostatectomy, in a man eighty-three years of age, was found to yield an organism resembling the bacillus mucosus-capsulatus. After running a clinical course of over three weeks with no improvement, it responded quickly to a single cauterization with stick silver nitrate.—E. A. Graham, *Surgery, Gynec. and Obstetrics*, 26, 394 (1918).

⁂

How to Breed Mice.—In breeding mice, one should be sure to use strong, healthy animals. If the mice are obtained from an unknown stock, they should be isolated for two weeks, and if any of them become sick during this time they must be discarded. Unless this precaution is taken, an epidemic will devastate one's stock. There are two ways of breeding mice: the family group method and the individual method. The mice should be inspected daily. If a mouse shows evidence of disease, it should be immediately isolated, and if severely affected, it should be killed at once. The three cardinal rules of successful mouse breeding are cleanliness, close observation, and isolation.—Conrad Hon, *Jour. Am. Med. Assn*, 70, 1225 (1918).

⁂

Facilitating the Serum Diagnosis of Syphilis under War Conditions.—According to Rhamy (*Jour. Am. Med. Assn.*, Nov. 17, 1917, p. 1728) guinea-pig complement can be preserved in a mixture consisting of 1 part of the fresh guinea-pig serum and 1.5 parts of a 10 per cent sodium acetate solution in 0.9 per cent saline for a considerable length of time at room temperature, and the acetate does not interfere with the fixation reaction. The author has confirmed Rhamy's statement and can add that the same is true of human complement. By mixing fresh serum with the acetate saline solution in equal parts the complement remains perfectly active at room temperature for at least five days, and the results of the tests made with the acetated serums are no different from those obtained with the same specimens in fresh state without the acetate. It is advisable, therefore, to preserve a specimen intended for transportation for some distance in a sodium acetate saline solution while the specimen is perfectly fresh. Sodium acetate may also be added directly to the blood while the patient is being bled for the test.—H. Noguchi, *Jour. Am. Med., Assn*, 70, 1252 (1918).

⁂

To Send Serum by Mail for Wassermann Test.—R. Tsuneoka and T. Yotsumiya relate that a safe and certain means for sending serum to a laboratory for testing is to soak up the serum into blotting paper and allow the paper to dry in a dark room at a temperature of from 80° to 86° F. Serum thus dried into the blotting paper can be kept without deterioration for five or six days. When the test is to be applied the serum is dissolved out of the paper by soaking in sterile saline and squeezing the paper. An abstract of their article is given in the *China Medical Journal* which publishes regularly, in pamphlet form, English abstracts of the leading articles in the current Japanese medical periodicals.—*Jour. Am. Med. Assn.*, 70, 1255 (1918).

PUBLIC HEALTH NOTES

Abstracts by M. E. Champion, M.D., M. P. Horowitz and David Greenberg.

Bovine Tuberculosis.—In 1917 among 40,000,000 hogs reaching packing plants 3,974,000 were found tuberculous by veterinary inspection. These hogs became infected according to the author by eating the feces of tuberculous cows. The consensus of opinion is in favor of the testing on every farm for tuberculosis but this would be a stupendous task for there are more than 6,000,000 farms in the United States. The hog, under present agricultural practices, where hogs and cattle are associated, can be made a practical tester,—the decision of the pig being recorded on his own post-mortem when he is brought to the slaughter house.

If every farmer immediately before shipping his hogs off to market could be induced or required to tag each hog showing the owner's name and address, it would be a simple matter to trace back all tuberculous hogs to their source, and by education and coöperation with the farmer, find the cows which are the reservoirs of the infection.—Rogers, B. R., *Amer. Journal of Veterinary Medicine*, 1918, XIII, No. 2.

(*D. G.*)

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Rural School Hygiene in Switzerland.—The medical inspection of country schools, a difficult problem everywhere, is thus handled by the canton of Vaud in Switzerland, C. Pahnd in an article in the *Revue médicale de la Suisse Romande* (Geneva, March, 1918) outlines their thorough system of physical examination of school children. This examination occurs every year and includes a skin tuberculin test, given, of course, with the parents' consent. The children found to be below par are reëxamined after a few months. An individual record is kept for each child of age, weight, height, chest measurement at expiration and inspiration, vision, hearing, aptitude for work, and previous tuberculin test. The teachers superintend the weighing of the children once a month; the height is recorded once in six months and the school rating once a quarter. Sun baths and gymnastics are given daily in pleasant weather, the children being in bathing trunks. There is a yearly conference with the parents to explain the advantages of the system. Two thirds of the parents gave their consent for the tuberculin tests. Finally, as the writer states, the system is completed and stabilized by a form of sickness insurance carried by the canton and the state. At an expense of 40 to 80 cents the child is insured against sickness so that when medical care is indicated from the results of the physical examination in the schools, the cost is taken care of from this fund.

(*M. E. C.*)

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To Guard Health of 250,000 Boys on Farms.—Inasmuch as 250,000 boys will work on farms this summer to aid in winning the war, each state director of the Boys' Working Reserve has been asked by the Council of National Defense to inspect and certify the farms where the boys will be placed. Special attention will be given to the prevailing housing conditions, and a separate bed will be required for every boy. The water supply and milk supply must be safe, and the privy must be satisfactorily located with reference to the well. Every boy is urged to be vaccinated against typhoid and paratyphoid.—*The Official Bulletin*, May 6, 1918.

(*M. P. H.*)

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WISCONSIN HEALTH NOTES.

Lieut. W. F. Whyte, M. D., president of the Wisconsin State Board of Health, is now attached to the medical staff at Camp Dix, Wrightstown, N. J.

A. A. Sliwinski, bacteriologist of the state branch laboratory at Rhinelander, Wis., has resigned to enter the military service.

With the endorsement of the State Board of Health, the Wisconsin Department of Agriculture has issued an order requiring the muzzling of all dogs in nine southern Wisconsin counties for a period of 120 days. Many cases of rabies, resulting in cattle losses and injury to humans, provoked the action of the state.

Wisconsin was admitted recently to the Birth Registration Area, following an intensive investigation by Census Bureau agents into the birth records of the state, which resulted in a percentage of more than 90 per cent completeness of registration. The law will be strictly enforced.

The State Board of Health will continue its health exhibit at the state fair and many county fairs this year. New health models and charts have been prepared to make the display more attractive and complete. A state Public Health Building of permanent design is in prospect upon the grounds of the Wisconsin State Fair.

The Plumbing Division of the State Board of Health is assisting several county fair associations in designing a sanitary toilet building, equipped with plumbing, adequate for the needs of a congested traffic common to fairs.

The State Board of Health issued during May a new bulletin entitled, "Wisconsin Code for Rural School Privies," promulgating a definite type of privy which must be followed when building new or remodeling old outbuildings in rural school districts. Seventeen sketches for contractors' use accompany the specifications, which are very complete and calculated to fulfill every requirement in preserving a sanitary environment. The code is the outgrowth of a strong demand for more sanitary school toilets voiced by school authorities, and its preparation was urged by the State Department of Public Instruction, the State Department of Engineering, and the Wisconsin County Superintendents' Association.

* * *

New Jersey Attacks Social Diseases.—A special committee was recently appointed by Dr. Charles V. Craster, health officer of Newark, N. J., to consider conditions of the city and how the local Department of Health could best coöperate with the United States Army and the Police Department in securing the more effective solution of the venereal disease problem.

The committee recommended that a bureau of venereal disease be created in the Department of Health with adequate personnel and equipment. The personnel is to include a nurse for follow-up work which was made mandatory by the recent state law concerning venereal disease control.

The committee urged active steps for the suppression of prostitution by examination of arrested prostitutes, their isolation and treatment, and custodial care of feebleminded prostitutes; also that physicians be required to report cases of syphilis and gonorrhea and that compulsory and systematic treatment be provided for the infected persons for the sake of public health.

The educational measures approved by the committee include posting of placards in men's lavatories and elsewhere, distribution of pamphlets of information, stereopticon lectures, exhibits, and definite provision for eliminating the advertising "specialists" and venereal disease nostrums. A free night clinic with four physicians in attendance should, the committee believe, be instituted for a period of six months and made permanent if found during that time to be effective. (*Gertrude Seymour.*)

Special "Drops" prevent the danger from
"BABIES' SORE EYES"
The drops will not hurt the baby's eyes
BUT
If they are not used, the Baby MAY GO BLIND

2 National Committee for the Prevention of Blindness, Inc., 130 East 22d Street, New York, N. Y.

Venereal Criminals in New York.—The enforcement of the new law aiming to secure better control of venereal diseases in New York State is proceeding steadily and with determination. In New York City a clinic has been established in connection with the night court. On the first night of its operation there were ten women arrested under the new law, nine of whom, upon examination, proved to be infected with a venereal disease. The procedure followed by the magistrates is the reference of all women who are arrested to physicians in the clinic for examination. They are remanded for three days for this purpose. If, after due test, they are proved infectious, they are sent to one of the institutions designated by the Department of Health, for treatment. They return to the court again when pronounced free from the infectious stages of disease, and then receive sentences proportionate to their offenses.

Rules and regulations are now being worked out by the Department of Health which cover the kind of treatment, the means of isolation, and the determination of freedom from infection. Although the law gives to each woman the privilege of consulting a private physician, this clause has not as yet been claimed, since the examination by the Department of Health is given without cost. *(Gertrude Seymour.)*

DON'T LISTEN
PEOPLE TELL YOU
"It's only a cold in the eyes"
"Use a poultice of tea leaves," etc.
THIS IS DANGEROUS ADVICE
NO HOME REMEDIES WILL CURE
"BABIES' SORE EYES"

4 National Committee for the Prevention of Blindness, Inc., 130 East 22d Street, New York, N. Y.

CONNECTICUT HEALTH NOTES

J. P. Balfe, former chief statistician of the Boston Health Department, has been appointed director of the Bureau of Vital Statistics, Connecticut State Department of Health.

Connecticut has just issued in pamphlet form the first chapter of its Sanitary Code relating to communicable diseases, which includes a very comprehensive section on the control of venereal diseases.

The Connecticut State Council of Defense has recommended an appropriation of $5,000 for a director of Public Health Nursing and Infant Welfare, $5,000 to coöperate with the Federal government in extra cantonment work in New London district and $20,000 for the establishment of hospitals for the care of women suffering with venereal diseases.

The plan of sending a birth certificate to the mother of every new-born child in the state has been adopted in Connecticut. This certificate is signed by the governor and commissioner of health, and will no doubt stimulate reporting of births.

MICHIGAN HEALTH NOTES.

Dr. E. T. Abrams, vice-president of the Michigan State Board of Health, died at his home in Hancock, May 21. His successor has no yet been appointed.

The City of Kalamazoo has been added to the list of cities employing full time health officers. Dr. A. H. Rockwell, former city physician, is the appointee.

Dr. W. F. English, a member of the State Board of Health, has received a major's commission and has reported for duty, being stationed at Fort Wayne.

The warm weather is making many demands upon the State Board for medical assistance in controling epidemics of typhoid and scarlet fever. The department has employed the services of a full time medical inspector, who spends his time in investigation of reports of epidemics and renders the necessary assistance in placing diseases under control.

Dr. C. G. Parnall, health officer of the city of Jackson, resigns his position July 1 to accept an appointment at the University of Michigan, in connection with the students' clinic.

E. R. Chambers, bacteriologist at the branch laboratory at Houghton, has entered the service, and was granted a leave of absence by the State Board of Health. George T. Buckell, assistant chemist in the Lansing laboratory, has been appointed to temporarily fill the vacancy.

General Medical Board, Council of National Defense Makes Report.—At the annual meeting of the General Medical Board of the Council of National Defense on May 5, 1918, a report on the activities during the past year was made, a summary of which appeared in the *Official Bulletin* for May 9, 1918. Some of the more important activities are briefly recorded below.

A child welfare committee was formed to study the best graphic methods for teaching child welfare; to study food values and diets for children; the midwife problem and the advisability of institutional care for children. A large program against venereal diseases was formulated and steps taken to establish venereal disease clinics. A campaign against the sale of patent medicines was also begun. Hospitals were classified as to size, convenience of transportation, equipment and other details. Committees were appointed to study into the problems of drug addiction, alcoholic control, public health nursing, tuberculosis, health statistics and industrial hygiene. Pupil nurses in training schools were increased by 20 per cent through the efforts of the General Medical Board. Plans have already been presented to the Secretary of War for the reëducation and rehabilitation of the wounded soldiers. Numerous antiseptics and disinfectants were examined and card indexed. Various preparations of thromboplastin were developed to help prolong the period for coagulation of the blood. These are but a few of the numerous things that have been accomplished. (*M. P. H.*)

* * *

The Question of School Closure.—It is the opinion of Dr. Alfred Greenwood, county medical officer for Kent, England, that the schools should only be closed in circumstances involving imminent risk of an epidemic, and where no alternative action is feasible. In the case of diphtheria it is really best to keep the schools open because that facilitates the tracing of the disease and the children may be more efficiently inspected and controlled by bacteriological examinations. The same opinion is rendered for scarlet fever because the disease generally spreads slowly, lasts long, and is kept up by slight or missed cases which can be more readily detected by close inspection at school.—*The Medical Officer*, March 16, 1918. (*M. P. H.*)

5 National Committee for the Prevention of Blindness, Inc., 130 East 22d Street, New York, N. Y.

Conservation of Vision Classes.—These classes are maintained for the benefit of those children who are not blind, but whose vision is so much reduced that they cannot do the regular classwork, or whose eyes are in such condition that the doing of much close work might make them worse. The oral work is done in the regular classrooms, where the children recite with the normal children. The written work is done on the blackboard or on blackboard desks, and pupils above the fourth grade are taught to write upon the typewriter, using the touch method. The text-books are all specially printed in clear face, heavy 36-point type, on unglazed paper of a buff tint, which is easily read. Much attention is given to manual training. The aim is not only to educate the partial seeing child with the least amount of eye strain, but also to teach him the kind of work he can do and how much he can use his eyes without harm, after leaving school.—*Cleveland Medical Journal*, 1918, p. 245.

(*D. G.*)

IS IT A BOY OR A GIRL?
Don't forget the *next* question:
"HAVE YOU PUT THE DROPS INTO THE BABY'S EYES?"

3 National Committee for the Prevention of Blindness, Inc., 130 East 22d Street, New York, N. Y.

Function of a Dispensary.—The aim of a modern, far-seeing, public dispensary is well expressed in the annual report for 1917 of the Boston Dispensary:

1. To relieve misery by prompt and efficient medical, nursing, and social service;
2. To diminish the financial burden upon the sufferers, their employers, and the public;
3. To prevent disease as well as cure it, by education of patients and of the community in measures of personal and public hygiene.

(*M. E. C.*)

✻

Prepared Meat Foods and Disease.—In *Public Health* (London) for April, 1918, Dr. W. G. Savage discusses the question of disease in relation to prepared meat foods. This term generally includes such foods as brawn sausages, saveloys, polonies, meat pies, salted meats and canned meats. Food may be infected either because the animal was diseased, or because the pathogenic organisms have gained entrance during the preparation or handling. To avoid the former possibility the internal organs of the animal, such as the liver and kidney, should not be used in the preparation of the food. Diseased meat should also be avoided. The food should always be thoroughly boiled or cooked before consumption, although even this process will not remove the danger from poisoning due to the presence of toxins from the Gaertner group of bacilli. Sausage skins should be sterilized before being used and should not be used freshly prepared. Preservative when added in small amounts to meat foods are injurious because they inhibit the development of putrefactive bacteria without affecting the Gaertner group of bacilli at all. The slaughter house should be kept separated from the food preparation room, and every precaution of cleanliness and decency should be practiced. The food handlers should be examined in order to exclude the possibility of disease carriers.

(*M. P. H*)

✻

Combating Venereal Diseases.—The Indiana State Board of Health has entered energetically into the work of fighting venereal diseases, and has organized clinics in each one of the thirteen Congressional Districts. Surgeon J. O. Cobb of the U. S. Public Health Service, has been detailed to coöperate with the State Board of Health. The first clinic will be organized and started at Valparaiso, Porter County, June 7. At that city there is a Vocational Training Detachment of the National Army with 1,500 men in attendance. The University at Valparaiso furnishes the facilities for instruction. The plan of organization is to secure the passage of an ordinance by the city which carries a sufficient appropriation. An office will be established and clinicians of experience and skill will be constantly in attendance for the first two or three weeks and thereafter once or twice a week.

Every man in the camp will be examined by the camp surgeons and the work of the State Board of Health will be to look after venereal diseases among the inhabitants of the city. Although the work will be done under the ordinance and at the expense of the city, the physician in charge will be a representative of the State Board of Health and in instances may be a representative of the U. S. Public Health Service.

At Indianapolis last November, the State

Board of Health joined with the city board of health in fighting venereal diseases. The police department and the police judge of Indianapolis are giving their coöperation. Suspected prostitutes are arrested upon suspicion and if convicted are sent to the State Woman's Prison at Indianapolis, where treatment is given them. If not convicted, they are remanded to jail for a few days, waiting further evidence, and at that period examination is made by the physicians of the State Board of Health, and if the patient is found infected, is placed in quarantine. Quarantine is in one wing of the city hospital and at the present time holds 12 patients, all under treatment and most of them knitting for the soldiers.

✣

Dried Milk as Infant Food.—The British Local Government Board has just prepared a report on the use of dried milk as an infant food. The report considers the testing of dried milk, the different methods of manufacture and distribution for sale, the chemical, physical, and bacterial characteristics, and the practical experience of its use in English, Belgian and French clinics. Where the baby cannot obtain mother's milk, or clean fresh cow's milk, it is recommended that dried milk should be used. Dried milk contains fewer germs than ordinary city milk, is less likely to contain pathogenic organisms, and will keep a long time if kept dry. The bacteria do not multiply in dried milk as they do in normal milk, and only that quantity of milk powder should be used as is required for a feeding. It is also pointed out, that there is no danger from scurvy or rickets.—*The Medical Officer*, April 13, 1918. (*M. P. H.*)

✣

The Significance of the Declining Birth-Rate. (Louis I. Dublin, *Science*, March 1, 1918.)—Not birth-control, but "birth release among the healthy and normal people of our country as a primary national duty" is urged by Doctor Dublin in this timely paper. "Such release," he says, "must be conscious and deliberate, the act of will of free individuals who thus express a highly moral purpose." This is the conclusion reached after a consideration of data showing that the United States, in common with the leading European countries, is suffering a serious decline in birth-rate which is selective in character.

The grave consequences of this change are more apparent in France than elsewhere, for there the birth-rate (18 in 1914) has declined to a point below the death-rate (19.6 for the same year), and the population has begun to diminish in number. In 1830 the rate was 30 births per 1,000 population, but there has been a gradual reduction of more than one third in the rate, so that as early as 1911 the birth-rate, 18.7, was lower than the death-rate, 19.6. On the other hand, the United Kingdom maintained a high birth-rate (over 30 per 1,000) up to 1895, and the German Empire up to 1909. Since these dates the birth-rates have declined rapidly in both countries.

The meager data available indicate that for every 1,000 population in the United States there are probably about 25 births and 15 deaths per year, which means a rate of natural increase of about 10 per 1,000 or 1 per cent annually. This is about the same as the rate of increase for England and Wales in the year before the war, and is not in itself particularly disquieting, although, "There has been a marked and continuous reduction in the birth-rate in the United States for a period of years." It is only upon looking beneath the surface that significant tendencies are observed. Without going into detail, the general points to be noted are:

1. That the great increase in total population is due chiefly to two factors: "(1) immigration, and (2) a high rate of increase in the foreign born rather than in our native stock."

2. That the decline in birth-rate has been selective, as elsewhere, and has been much more marked among native stock than among stock of foreign parentage.

3. That "The race stock which laid the foundations of our institutions during the critical period of our national existence is in large areas of the country no longer maintaining itself and its place is being taken gradually but surely by foreign races."

4. That further evidence of the selective character of the decline in birth-rate is furnished by the fact that college men have few children and college women still fewer.

5. That, on account of early mortality, the 12 or 15 per cent of persons who do not marry or marry too late for reproduction, and the more than 7 per cent of marriages that are sterile, it is necessary for each fertile marriage to produce on

an average close to four children in order that a population may remain stationary or a race stock maintain itself without increase or decrease. This estimate is based on American conditions.

6. That for the foregoing reasons, "The best blood of America is being constantly thinned out by the exercise of a conscious limitation of births and is being replaced by a stock of a different order. Our national standards are being levelled to meet more and more the lower quality of our population."

Doctor Dublin charges that the state is largely responsible for this condition of affairs. The education which the state has provided has "failed for the most part to inculcate national ideals" into the youth of the country and has trained girls for careers rather than for normal home life. Another "sin" charged against the state is that, "It has made no provision to reward, either substantially or with esteem, the women who . . . are willing to bring up families of normal size." Again the writer says that "Individual selfishness is at bottom the source of the evil I have described"; but even here the state is brought in for its share of responsibility, for he adds that "Under present conditions children are not an economic asset. Restrictive compulsory education and child-labor laws make children an expensive luxury which only the poor can afford."

The remedy suggested is a fuller realization that we live not for ourselves alone but for the community. To turn the tide, "our appeal must be made to the religious impulse in our individual lives." After further discussion of this point, the author closes with the conclusion given above.

Millard Knowlton, M. D.

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Tobacco Smoke and Pulmonary Tuberculosis.—Webb in a study on "The Effect of the Inhalation of Cigarette Smoke on the Lungs," finds that of a comparatively large body of young men (over 3,000), the proportion that was discharged from active army service because of active tuberculosis was no higher among the smokers, the men who had signs of chronic bronchial irritation, than among the non-smokers with what might be called normal bronchi.

The author of this editorial commenting on Webb's findings emphasizes the point that today with our newer knowledge of the relative incidence of infection and morbidity, few would believe that if men with inflamed throats and bronchi fell ill with tuberculosis, this disease was the result of recent infection. We should be more inclined to believe that the disease represented the awakening of old quiescent tubercle, planted perhaps years before. Irritation of the upper respiratory tract in an adult plays no part in infection. If it does anything, it probably resists a fresh infection. That while too much inflammation is bad for a tubercle, a little bit of inflammation either exerts no deleterious effect on it or may, indeed, be good for it. That is, everything else being equal, the net effect of a mild irritation is mildly "stimulating" and tending to repair.—Allen K. Krause, *Amer. Review of Tuberculosis*, 1918, II, 99.

(*D. G.*)

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Health Standards and Care for the Immigrant.—In response to the nation-wide demand for better and more thorough ways of Americanizing the immigrants in the United States, the Carnegie Corporation has undertaken a national study of the methods of Americanization now in use. The work is to be done by ten divisions which are to conclude the study in a year.

The Division on Health Standards and Care, under the direction of Michael M. Davis of Boston has begun its study. The aim of this particular division is to learn what the health agencies throughout the United States are doing to teach the immigrant our American standards of health. A special effort will be made to study methods which have been successful in some localities and to develop from these recommendations for communities having similar problems. The division earnestly desires the coöperation of health departments, hospitals, dispensaries, industries, nursing and medical associations, and all the national organizations working to promote the public health. Any suggestions which have developed from the experience of these organizations will be most welcome. It is hoped that by means of this national survey material can be secured which may prove helpful to those individual groups who are striving to make the immigrant a better American citizen.

Prevention of Blindness.—The National Committee for the Prevention of Blindness in order to bring before the public the menace of eye defects and diseases, and the manner of overcoming them, has prepared an exhibit for this purpose. The exhibit comprises five posters (20 inches by 26 inches) well illustrated. A set of these can be obtained for 50 cents from the committee (130 East 22d St., New York City).

(*D. G.*)

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Enlarged Neck Glands from Decayed Teeth.—Baude, writing in the *Paris Médical*, and quoted by the *Journal of the American Medical Association*, May 11, 1918, emphasizes the importance of the teeth in producing enlarged glands of the neck. The cause of such enlarged glands often should be laid at the door of decayed teeth rather than of the tubercle bacillus. In many instances, glandular infection with the tubercle bacillus is secondary to ordinary inflammation. This writer feels that proper treatment of the teeth should be an indispensable preliminary to any other form of treatment. If the patient cannot afford the time or expense of careful dentistry, extraction of the tooth is indicated.

(*M. E. C.*)

INDUSTRIAL HYGIENE AND OCCUPATIONAL DISEASE

ABSTRACTS BY DRS. E. R. HAYHURST AND P. M. HOLMES.

Delayed Reaction Time a Cause of Accidents.—The French medical authorities on aviation candidates are rejecting such candidates where their reaction times including the visual and others to normal stimuli are slowed or not up to the noraml standard. The reaction time may be delayed by fatigue, drugs, and excesses, but in some individuals is invariably much slower than in others. (A similar explanation can undoubtedly be frequently given for industrial accidents and bespeaks the advisability of including such tests in the physical examination of certain employees.—E. R. H.) H. Graeme Anderson. *British Medical Journal*, 1913, Vol. I, p. 73.—It is interesting to note in this connection, however, that equilibrium tests as established in the Bárány chair in which the individual is rapidly whirled, are without apparent correlation to actual flying ability and individuals who "fell down" on the tests have proved to be acceptable flyers.—R. P. Parsons and L. H. Segar, *Jour. A. M. A.*, April 13, 1918, p. 1064.

⁂

Lead Poisoning Simulating Mumps.—J. Comby, in a French medical journal, cites 12 cases of lead poisoning with chronic parotitis having an aspect like that of mumps. The enlarged glands were not tender and did not seem to incommode the men. Other signs of lead poisoning were present.—Abstracted by *Jour. A. M. A.*, March 16, 1918, p. 816.

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Instructions for the Inspection of Plants Where Anilin is Produced or Handled. *Bureau of Hygiene and Sanitation (John Roach, Chief), Department of Labor, New Jersey*, Trenton, N. J. 6 pp. This pamphlet is timely, in view of the importance of anilin in a number of industries, among which may be mentioned dyes, rubber, explosives and some cleaning processes.

⁂

Prevention and Control of Disease in War Industries.—Fatigue, industrial poisoning, defective illumination, dust, fumes, heat and humidity are instrumental in the disorganization of industries fundamental in the successful prosecution of the war. Success in manufacturing and transporting war materials can only be achieved by maximum continuous production over the entire interval of the war. The most important feature influencing production is keeping the worker well. An adequate program of supervision of health in war industries should include: (1) the creation of minimum standards of industrial hygiene; (2) sanitary supervision of premises, buildings and processes; (3) medical supervision of workers; (4) the avoidance of industrial fatigue; (5) education in personal hygiene; (6) collateral studies of the effect of fatigue, rest periods, monotony, mental and physical stress; (7) sanitary supervision of industrial communities; (8) introduction of measures which will safeguard the moral side of bodily health.—J. W. Schereschewsky, M. D., *Medical Record*, April 6, 1918, p. 5.

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Labor Getting Behind Health Insurance.—In a series of three reports the N. Y. State Federation of Labor has endorsed compulsory health insurance and has drafted a bill which is now pending in the state legislature. They have concluded that there is an unmistakable trend toward state-administered health insurance, and that they "may hold back blindly until a bill is passed which is disadvantageous and burdensome, or have a bill so drafted as to protect and promote the interests of organized labor." Health insurance will cause employers to assume financial responsibility for that portion of sickness rightfully attributed to industry and will give them a new interest in sickness prevention. The introduction of health protection devices will be given the attention formerly given only to safety devices. This is best stimulated when it means a reduction of the insurance premium. If the world war is to result in permanently improved conditions for those who suffer the hazards of occupational disease and premature death, it must come through a more democratic relationship between employers and employees. —*The Survey*, March 30, 1918, p. 708.

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Conference of Industrial Physicians in Pennsylvania.—More than two hundred and fifty physicians attended the Sixth Conference of Industrial Physicians and Surgeons held at Harrisburg on April 9 under the direction of the Pennsylvania Department of Labor and Industry.

Dr. Francis D. Patterson, Chief of the Division of Industrial Hygiene and Engineering, presided, and a program of extraordinary interest and timeliness was presented.

Mrs. Samuel Semple, woman member of the Pennsylvania Industrial Board, offered the results of her recent investigation into the employment of women in Pennsylvania in so far as they are replacing men. She warned particularly against their employment in occupations demanding the lifting of heavy weights, prolonged standing, or excessive stretching; and spoke most forcibly against the relaxation of any of the protective laws which Pennsylvania has thrown about its workers.

Major Edward Martin, Major Joseph C. Bloodgood, and Dr. Loyal A. Shoudy urged cooperation of all industrial physicians with the government to maintain every worker at the highest point of physical efficiency for the better performance of his work in industry and so that he may be physically fit to perform the duties devolving upon him if called from his place in the shop to a place in the fighting line. And further that every physician and surgeon should endeavor so to reconstruct and rehabilitate the injured in industry that all workmen disabled by accident may at the earliest possible moment be returned to performing a maximum of service for the government.

A large series of motion pictures showing the method of training cripples to enter useful and remunerative occupations, which films have just been produced under the direction of the Surgeon General of the Army, were a most interesting feature of the program.

The discussion of the question of Amendment to the Pennsylvania Workmen's Compensation Law by widely divergent and very representative interests brought forth almost the unanimous opinion that this law should be amended so as to provide for compensation to the physician during the entire period of treatment of the injured workman, that the waiting period for compensation to the injured person be decreased, and that a larger percentage of wages be given in compensation than is now awarded under the present act. (*F. D. Patterson, M. D.*)

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Nystagmus Can be Caused Through an Accident.—Nystagmus or a spasmodic movement of the eyes, frequently affecting miners and others working in a dim light and a stooping position, and always hitherto considered an occupational disease, can be caused by a blow on the head according to a decision recently rendered by the Superior Insurance Office in Dortmund, Germany. The decision was based on the mass of evidence produced in connection with a case for accident compensation.—*U. S. B. of L. S.*, March, 1918, p. 193.

Ventilation and Respiratory Diseases.—An important summary is given in the news column of the *J. A. M. A.*, March 30, 1918, p. 941, of the findings of the Bureau of Child Hygiene in New York City and the State Commission on Ventilation in classroom ventilation. Investigation was carried on among 5,533 pupils of 76 classrooms in 12 schools operated under three different types of ventilation and for a five months' period in the fall, winter and early spring. The conclusions follow: "In the closed window, mechanically ventilated type of classroom kept at a temperature of 68 degrees F., the rate of absences from respiratory diseases was 32 per cent higher than in the open window, naturally ventilated type of classroom kept at the same temperature (about 68 F.) and about 40 per cent higher than in the open window, naturally ventilated type of classroom kept at a temperature of about 50 degrees. The relative humidity of classrooms, whether ventilated by natural or mechanical means, was not a causative factor in the occurrence of respiratory illness among school children."

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Compensating Physicians for Reporting Occupational Diseases.—According to Porter, Medical Officer of Health, London, it is the custom in London for the city to pay small fees for reporting communicable diseases with the special idea of securing coöperation of family physicians. (Contrary to the prevailing opinion that physicians should consider it a part of their duty to the state to report notifiable diseases of all types, including occupational diseases, without compensation therefor, is the opinion voiced by some that such reports constitute part of the bookkeeping of the commonwealth and as such should be paid for. It is clear that the commonwealth needs such statistics and were the matter presented clearly, the people would have no objection to paying for the same. By what assumption physicians should be presumed to perform such services gratis when county clerks, lawyers and others invariably receive a fee for similar services, is certainly enigmatical. —E. R. H.)

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"Adequate Ventilation" Defined.—A resolution adopted by the Health Department of New York City on December 11 states that in the interpretation of the Sanitary Code the term "Adequate Ventilation" will be as follows: (1) The temperature of rooms during periods of occupancy should register preferably from 60° to 70° F. at all times, except when the outside temperature exceeds 60°. This does not apply to rooms used for special purposes, such as industrial places where high or low temperatures are essential and unavoidable. (2) The relative humidity in occupied rooms should not exceed 70 per cent, except when the outside (wet) bulb temperature exceeds 59°. (3) The carbon dioxide in occupied rooms of all classes should not at any time exceed 10 parts in 10,000 volumes of air in any part of the occupied spaces of the rooms. (4) The dust particles in the air of occupied rooms in all classes of buildings should not exceed 1,000,000 per cubic foot. (5) The bacterial content should not exceed 100 per cubic foot. (6) The air of occupied rooms should be free from objectionable odors.—*Medical Record*, March 9, 1918, p. 426.

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THE SAFE LIMIT OF CARBON DIOXIDE IN THE WORKING ATMOSPHERE.

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THE preparation of the following résumé was suggested by the fact that there is an apparent lack of harmony between the generally accepted standard of permissible carbon dioxide in the working atmosphere and the conclusions of modern investigators regarding the effects of the inhalation of this gas.

That air containing excessive respiration products is unwholesome was known to Mayow (1). That investigator discovered oxygen, showed that this gas, "nitro aerial gas," is present in air and is consumed both in respiration and in combustion. Fifty years later Hales (2) showed that air is polluted by a deleterious substance given off from the lungs and which may be absorbed by potash, and the air thereby rendered more suitable for respiration, while, still later, Black (3) proved that this gas is carbon dioxide. The rediscovery of oxygen by Priestly and the light subsequently thrown upon the nature of respiration and of combustion by Lavoisier (4) enabled the hygienist for the first time to make an intelligent study of the problem of ventilation. Priestly (5) showed that carbon dioxide is poisonous, speedily causing the death of an animal confined in it. It was discovered later that this gas under these conditions is irrespirable, causing suffocation by closing the glottis. It was shown still later that the concentration of carbon dioxide in air must be very high before death results from inhaling it. Thus Paul Bert showed that when small animals such as rats and young rabbits are confined in a volume of air from five to thirty times the body volume of the animal, death did not occur in some cases for several hours. Also an analysis of the residual air of the chamber showed, on an average, about 3 per cent of oxygen and 15 per cent of carbon dioxide. It is probable that death was caused in these cases by lack of oxygen and not by the accumulated carbon dioxide, as the blood of the animals was venous. When, however, Bert (6) repeated his experiments, employing instead of ordinary air an air containing 50 to 75 per cent of oxygen, death resulted when the carbon dioxide in the chamber had risen to about 25 per cent, *i. e.*, when from 25 to 50 per cent of oxygen still remained in the air of the chamber. These experiments proved that carbon dioxide caused death in these cases, since the blood of the animals at death was generally arterial. In some of Bert's experiments the arterial blood of his experimental dogs was found to contain at death 116 volumes per cent, and the venous blood 120 volumes per cent of carbon dioxide. This gas, therefore, can not be considered a quick or a violent poison. Indeed, Mosso (7) claims, as a result of numerous experiments carried out under greatly diminished pressure in a respiratory chamber or at great elevations in the Alps, that the animal system is so adjusted to the presence of a certain per centage of carbon dioxide in the arterial blood that a greater disturbance in health and comfort results from a deficiency, than from a corresponding excess of this gas in the blood.

It is undoubtedly true that the early hygienists regarded the discomfort and ill health resulting from rebreathing air as due to chemical causes, viz., deficient oxygen and excessive carbon dioxide. The first of these theories was abandoned when it was learned that defibrinated blood may be completely saturated with oxygen in contact with air containing 14 per cent or less of that gas, a figure that is generally far exceeded in the most highly polluted air. As regards the latter theory, it was early held that expired air contains subtle organic poisons as well as carbon dioxide. This theory was apparently borne out by the fact that unpleasant odors are usually in evidence in air that is much polluted by respiration. But as the nature and methods of determination of these poisons were unknown, while carbon dioxide could be quickly and accurately determined, hygienists contented themselves with assuming that the percentage of the latter was an accurate criterion of the purity of air. The safe limit of carbon dioxide in the working atmosphere was, after numerous experiments, fixed by Pettenkofer and others at amounts varying from .07 per cent to 0.1 per cent.

That chemical factors cause the ill effects resulting from breathing air charged with respiration products was generally accepted until within the last thirty years. Hermans (8) in 1883 seems to have been the first to suspect that the physical factors, temperature and humidity, might be of greater importance than the chemical factors in determining the quality of air; working with human subjects, who re-breathed air until its oxygen fell to 14.4 per cent, Hermans came to the following conclusions: (1) that no organic poisons are present in exhaled air; (2) that if the subject were cleanly in clothing and in person no odorous substances were given off; (3) that the gaseous exhalations from the lungs were without effect on the comfort or the health of the subject, even when the carbon dioxide in the chamber rose to 5.3 per cent; (4) that the axillary temperature of the subject rose as much as 1.1 degrees Fahrenheit as a result of a two-hours' stay in a crowded room; (5) that ventilation is necessary mainly to sweep out dust particles and microorganisms, and to keep down the air temperature and humidity, the actual causes of the ill effects of breathing the air of crowded rooms.

Flügge (9), Paul and Ercklentz (1905), with a somewhat improved method, showed that Hermans' conclusions were in the main, correct; that when the temperature of their experimental chamber was kept at 50° to 62° Fahrenheit with a relative humidity of 50 per cent, while the carbon dioxide rose to 1.6 per cent at the close of their three and a half hours experiment, not the slightest unfavorable result was noted; that this was true, even in the case of subjects having chronic bronchitis, asthma, emphysema, mitral insufficiency, or nephritis with hypertrophied heart; also, that when the room in which a teacher and fifty to sixty pupils were working was kept wholly without ventilation for three hours at a temperature below 62° Fahrenheit with a relative humidity of 50 per cent, teacher and pupils proceeded with their work apparently wholly unaffected by the accumulated carbon dioxide in the air and with unimpaired capacity for doing mental work.

Flügge (10) states that Hermans' investigations bore valuable fruit, as several authors embodied in their works some of the principles established by him in this research. Thus Rietschel, in his "Principles of Ventilation" which appeared in 1893, mentioned the importance of keeping down the temperature of the air of a room as well as of removing chemical poisons. Also Krieger (1899) in a work on the value of ventilation makes the following statement: "The value of ventilation for the purpose of introducing fresh air into dwellings, schoolrooms and hospitals is not as great as is generally supposed. Much more important is ventilation in the establishment of a proper temperature and air movement as well as for the regulation of the humidity."

Flügge laments the fact that the German hygienists had for twelve years overlooked the importance of Hermans' work and that it was in so few places being put into practice.

Various investigators, Haldane, Hill, Benedict, and others have confirmed the conclusions of Hermans and Flügge.

An important recent investigation is that of the "Chicago Commission of Ventilation," the report of which appeared in 1914. One aim of this commission was "to conduct such experiments as will make the practice of ventilation a branch of applied science." Elaborate and careful studies were made of the ventilation of picture theaters, schoolrooms, and other buildings. Some of the conclusions of this commission are as follows:

1. That carbon dioxide as encountered in working practice is not the harmful agent of major importance in expired air or in air otherwise contaminated.

2. That in those processes of manufacture where considerable carbon dioxide is liberated, the carbon dioxide content is not a proper index of air pollution.

3. That in street cars, elevated cars,

etc., the carbon dioxide content of the air should not rise above .12 per cent.

4. That a temperature of 68° Fahrenheit, with a proper relative humidity, is the best maximum temperature for living rooms artificially heated.

5. That from the standpoint of health, relative humidity is one of the important factors in ventilation.

6. That efficient air cleaning devices are desirable in all ventilating installations where the air supply is liable to be contaminated by dust or other objectionable matter.

7. That the bacterial content of the air is an important factor in all ventilation, and bears a direct relation to the source and quantity of air supply.

8. That the temperature of a schoolroom should be kept as low as the comfort of the occupants will permit; and that the temperature may be maintained lower with comfort by increasing the relative humidity.

The commission worked out, also, a valuable "Comfort Zone" chart.

In 1915 there appeared the paper on "Some results of the first year's work of the New York State Commission on Ventilation" (11). The findings of this commission are especially trustworthy and valuable for various reasons: (1) the work was planned and carried out by seven experts in seven related fields, while previous work on this subject generally has been conducted by one investigator; (2) the apparatus employed was more complete and perfect than that previously used in such work; (3) the number of subjects studied and the length of experiments were both greater than ever before; (4) the physiological and psychological condition of the subjects were very fully noted; (5) the effects of various temperatures and degrees of humidity were noted.

Results: I, The conclusions of Hermans, Flügge, Hill, and others were confirmed in regard to the importance of the physical factors of temperature, humidity of air, and air movement; II, Parallel experiments conducted for the purpose of comparing the effect on their subjects of pure air with that of air containing from .1 to 1.3 per cent of carbon dioxide, temperature and humidity being the same throughout, showed: (1) that the subject seemed about equally comfortable in pure and in stagnant air; (2) that body temperature, heart rate, increase of heart rate on standing, blood pressure, Crampton value, and respiration of the subject were practically the same in pure and in stagnant air; (3) that the chemical condition of the air had no perceptible influence on the amount and accuracy of mental and physical work; (4) that the quantity of food eaten by a subject was slightly less in stagnant than in pure air.

Lee and Scott (12) have recently found in experiments on the excised muscles of cats that had been kept for some hours under definite conditions of air temperature and humidity, that the capacity for work of the muscles varied with the conditions. Thus, the work done by a muscle from an animal which had been kept under comfortable conditions (69° Fahrenheit and 52 per cent relative humidity) was about 33 per cent higher than that done by the corresponding muscle from an animal kept at 91° Fahrenheit with a relative humidity of 90 per cent. These results illustrate well the deleterious influence on nervous and muscular tissues of high temperature combined with very high humidity.

Cocks (13) has shown in work on human subjects, using an improved Glatzel metallic mirror, that the continuous breathing of hot, dry air, or of hot, moist air, leads to serious respiratory trouble, atrophic rhinitis being noted in 35 per cent and 45 per cent respectively of the cases under the conditions just noted.

The conclusions of investigators seem then, to be about as follows: In the opinion of Flügge one may breathe for several hours air containing twenty times the usual permissible percentage of carbon dioxide without perceptible deleterious influence upon his health.

The more rigorous methods of the New York State Commission for Ventilation reveal the fact that stagnant air containing two to fifteen times the generally accepted amount of carbon dioxide may be respired seven hours per day for five or more weeks with no perceptible effect upon heart rate, on increase of heart rate on standing, on blood pressure, Crampton value, or respiration of the subject.

On the other hand, all the deleterious effects that were formerly attributed to respiring carbon dioxide present in stagnant air may be produced by breathing, for the same period, air that is practically free from carbon dioxide but which has a temperature of say 90° Fahrenheit and a very high relative humidity.

Also that a cold, dry air when heated to 80° or more without humidification may produce, when respired for some time, the deleterious results so beautifully demonstrated by Cocks.

The matter is well summed up by Professor Lee when he says that "the problem of ventilation is physical rather than chemical, cutaneous rather than respiratory."

In view, then, of the fact that recent investigations have apparently shown carbon dioxide to be harmless when respired in much larger amounts than .08 per cent, the writer would suggest that the safe limit of this gas in the working atmosphere be placed at .2 per cent.

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A MATERNITY AND INFANT WELFARE PROGRAM FOR THE UNITED STATES.

J. H. Larson,

Secretary, Committee for the Reduction of Infant Mortality of the New York Milk Committee.

Read before the Public Health Administration Section, October 17, 1917, at Washington, D. C.

"LONDON, May 8.—England will shortly add another ministry to its 'win-the-war' government—a ministry of health.

" 'One of England's greatest needs today is the formation of such a ministry,' Lord Rhondda, chairman of the Local Government Board, told the United Press today. 'Fifty thousand babies alone can be saved to the country through its control. Under the present system there is a large amount of overlapping in governmental work, leading to friction, unnecessary expense and waste of energy. I estimate that one national bill alone, enforcing government supervision of maternity and infant welfare, will save fifty thousand young lives a year. Such a bill will be introduced at an early date.' "

"A German Dispatch via Copenhagen, May 27.—The decrease in births was accompanied by a corresponding fall in the death-rate of infants under one year old, which was 13.3 per cent per hundred births, but this has not diminished the anxiety of the sociological experts, who are holding congresses to awaken popular interest in this menace to Germany's future. The Government is devoting intensive study to the repopulation problem through commissions attached to the Minister of the Interior and shortly will introduce legislation in the Reichstag to counteract the nation's falling rate of growth by measures calculated to stimulate the birth-rate and lower infant mortality."

Major Edward Rist of France is now in this country to acquaint himself as to what is being done here by public and private agencies in the way of life and health conservation. From this it appears that after three years of war, Great Britain, France and Germany, as well as other warring nations, are realizing the necessity of conserving its potential citizenship of the future. These Nations hope that by intensive methods of maternal, infant and child conservation, enough lives can be saved above those saved by ordinary methods in times of peace to replace in a few years the man power lost because of the war.

Such tardy recognition of a necessity of this magnitude should not be permitted in the United States if we are to survive the termination of the present conflict to our best national advantage. It behooves us at this time, when we are drafting our young manhood into actual military service, to take immediate steps in formulating and inaugurating a national program working towards conserving our man power of the future. A program of this kind should include:

(1) Prenatal nursing and maternity clinic service coördinated with the highest standard of obstetrical service obtainable.

(2) Nursing care for mother and

child during confinement, with rigid observation of rules and conduct prescribed by our highest medical authorities.

(3) See that every birth is officially reported to the proper authorities.

(4) Home visiting and clinical supervision by physician and nurse of mother and child, for one month after confinement with frequent and thorough physical examinations.

(5) Registering the mother and child at a babies' milk station or clinic with home visiting when necessary until the child is two years of age.

(6) Nursing and medical supervision of child during its pre-school age.

(7) Making available to all children of school age physical examination and medical supervision.

(8) Strengthen, rather than relax, our child labor laws and insisting upon a definite mental and physical standard with satisfactorily completed school work before working papers are issued.

This is a program of no mean proportions. In many places in this country where infant and child welfare activities have not been undertaken by either private or public initiative, it will require a great deal of time and effort for organization, equipment and getting the work under way. In other centers, such as the large cities in which the last decade has shown tremendous progress in preventive effort along these lines, the work will be comparatively simple. In New York City, for instance, the milk stations, public and private, cover nearly all the areas where reside mothers whose infants need milk station supervision. Similar activities provide care in a large measure, though not adequately, for children of pre-school age. The public school inspection is thorough and complete. Physical examination of school children by the Department of Health is of a high standard and effective. The child labor laws are enforced and public sentiment has so far prevented commercial greed from being successful in its attempt to relax these laws through legislation.

In the list enumerated, the most significant items and those deserving of the highest character of intensive effort are those which have for their objective the prevention of unnecessary loss of maternal and infant life, and it is for such a program that a national plan of action is here proposed. It has been pointed out by the Federal Children's Bureau that maternal deaths from causes due to pregnancy and confinement in the United States are exceeded only by deaths from tuberculosis. Among the so-called progressive nations of the world, the United States ranks fourteenth in its annual loss of mothers from causes due to pregnancy and confinement. This fact is rather disconcerting when it is pointed out that the total number of nations included in this group is only sixteen. The maternal death-rates per 100,000-of the general population ranges from the maximum of 19.6 for Spain (United States 14.9) down to 6.0 for Sweden.

The national problem confronting us in considering a preventive program of this kind cannot be stated with statistical accuracy. From our census and vital statistics, however, it is at least possible to get an approximate idea of its magnitude.

Out of every 1,000 pregnant mothers in New York City in 1916, 5 died from causes due to pregnancy and confinement, 43 gave birth to stillborn infants and 35 lost their babies through death during the first month after birth. Of the 18,000 potential lives that did not survive till the end of the first year after birth, over one-third were born dead, nearly one-third died during the first month after birth, and one-third during the remaining eleven months of the first year. This means that two-thirds of this sacrifice took place during the utero-gestation period and during the first month after birth.

A very conservative estimate may place the annual number of pregnancies in the United States at 2,650,000. Out of this number 15,000 of these mothers will lose their lives from causes due to pregnancy and confinement; 150,000 will give birth to dead babies; another 115,000 will lose their babies through death during the first month after confinement. This is an annual loss of 280,000 lives which is a direct annual tax upon the business of American Motherhood. That in brief is our national problem.

Given a practical working-program what can we hope to accomplish in the way of minimizing this loss? It has been conclusively demonstrated that stillbirths can be reduced 22 per cent and deaths under one month 28 per cent. Out of a total of 3,145 expectant mothers under the care of the New York Milk Committee, only five or 1.5 per 1,000 mothers died. The maternity death-rate throughout New York City was three times the rate that this experiment in prenatal care attained. And among the sixteen leading countries of the world the maternity death-rate per 100,000 population ranges from 6.0 to 19.6. In this list the United States ranks fourteenth with a rate of 14.9.

That the above percentage reductions are far from impossible has been proven by the statistical evidence of organizations which have worked along these lines. Their general attainment requires only that intelligent conservative prenatal, obstetrical and infant care effort during the utero-gestation period and the first month after birth be extended to all the mothers and babies in need of this care. National application of these possible reductions means saving 10,000 out of the present toll of 15,000 mothers. It means preventing 33,000 out of the 150,000 stillbirths. It means preventing 32,000 out of the 115,000 deaths under one month. Out of the present sacrifice, then, of 280,000, we should at least be able to salvage 75,000 lives.

Though it may sound utopian, this estimate is really very conservative. It exceeds Lord Rhondda's estimate numerically only. His proposed saving of 50,000 lives is out of a population of less than 50,000,000, while our proposed saving of 75,000 is out of a population of more than 100,000,000. And it can be done, if the public in general and the medical profession in particular will remember that an infant is nine months old when it is born, and that it needs expert care during this period even more than it does after birth. All of our eminent pediatrists are agreed that frequent and thorough physical examinations during the first month after birth will discover and prevent a large number of the ailments which cause deaths of infants during the period immediately following birth.

In many communities there are now milk stations and other baby welfare agencies organized to prevent baby deaths, but very few babies are enrolled at such stations until after they are one month of age. (In New York City the average age of babies when registered at milk stations is three and one-half months.) Furthermore, these activities are very largely limited in scope to feeding problems, and are therefore comparatively simple, due, as is shown above, to the fact that only one-third of these potential baby lives survive until the milk station age is reached. The more difficult problem of conservation, as well as the more important, is to inaugurate a program which will, in a measure, prevent the unnecessary sacrifice that is now taking place during the utero-gestation period and the first month after birth.

To provide adequate maternity care for that large group of mothers in which the milk station is especially interested requires practically only the coördination of existing agencies to make this service available. Prenatal conditions, however, have no respect for class or financial position so that it will be necessary, through propaganda and education, to get every expectant mother interested in herself and the future welfare of her infant. The great middle class of the population is the backbone of this or any other nation. It is a notorious fact that it is only the very poor and the very rich that can get the best medical service available—the poor because they can get this service free—the rich because they can pay for this service, not only for themselves but for the poor as well. The average home, however, can afford only the average medical talent, and it is here that the greatest future progress lies in a campaign of this kind. But even among these it is going to be a comparatively simple matter in large centers of population because agitation along these lines has been under way for a number of years. Even here, as well as in all outlying districts, the necessity of carrying the message of mother and child conservation into every home through intensive organization is imperative.

Our country is now definitely committed to a policy of forcibly resisting aggression against democracy. The future of the United States, as well as the other warring nations, lies in the babies that are born today. Baby saving abroad has become almost as serious a problem as the war itself. It is more urgent now than ever before that all our efforts to prevent unnecessary loss of infant and maternal life be extended and intensified. The future has its need for the child of today, in the home, on the farm, in the workshop, the office and various parts of trade. We, as a nation, owe to those of our young manhood who gladly will sacrifice their lives on the field of battle, the rearing of sturdy successors to carry on their abandoned work in times of peace.

In order to accomplish this we must inaugurate a comprehensive national program to make the experience and knowledge we already have in prenatal and maternity care available to every expectant mother in the nation, and nursing care to all babies until they are one month old when they can be registered at milk stations or other baby welfare agencies.

Nothing has been said of our present standard of obstetrical practice. We all know that, as a national proposition, this practice is far inferior to what it should be. However, it is a demonstrated fact that prenatal care and supervision alone automatically raises the standard of obstetrical practice both among the physicians and the midwives. Though we should urge standardization of training along these lines in all the medical colleges, hospitals, and schools for midwives, the program proposed will in itself make this work more efficient among the general practitioner of obstetrics.

OUTLINE OF PURPOSE, SCOPE AND ORGANIZATION OF A NATIONAL PROGRAM FOR MATERNITY AND INFANT WELFARE.

1. *Purpose.*

(a) Prevent unnecessary maternal deaths from causes due to pregnancy and confinement.

(b) Prevent unnecessary death and sickness in early infancy.

(c) Prevent unnecessary still and premature births.

(d) Conserve the health of the mother and thus reduce invalidism.

(e) Promote intelligent motherhood and maternal nursing.

(f) To place all babies under the influence of milk station or other Baby Welfare Agencies as early as possible.

2. *Scope and Character.*

(a) Registration of expectant mothers as early in pregnancy as possible.

(b) Mothers to remain under active supervision and care until one month after confinement.

(c) Expectant mothers should be urged to attend a maternity clinic every two weeks up to the eighth month and every week thereafter.

(d) If after being visited by the visiting nurse the mother fails to report to the clinic she should be visited in her home by the physician in charge of the clinic.

(e) Every patient should bring a specimen of urine for examination at each visit.

(f) Every patient should be given a copy of Instructions to Expectant Mothers or a copy of Prenatal Care published by the Children's Bureau.

(g) Complete record of services rendered and care given each mother should be maintained by use of uniform prenatal history card and physical examination card.

(h) Provide instruction in hygiene of pregnancy and the care of the new born infant.

(i) Provide special medical care and supervision for all abnormal cases.

(j) Provide adequate care at confinement.

(k) Provide through the coördination of all agencies interested any other care or help that the mother or her family may require.

(l) Provide a clinic where midwives may bring their cases and get expert advice.

3. *Organization.*

(a) A small National Committee organized as a sub-committee of the Federal Council on National Defense, with headquarters at Washington, D. C. This Committee to be responsible for inaugurating a national program of maternity and infant welfare.

(b) To duplicate this National Committee in each state in the Union, each state Committee being a sub-committee of the National Committee.

(c) Each state committee to appoint as many sub-committees as are necessary to adequately extend the work into every community in the state.

(d) Communities should be divided into zones with a central registration office, where should be registered all expectant mothers receiving maternity care by the various hospitals and organizations in that zone.

(e) Each such central registration office should report according to uniform tabulations the essential statistics of its work.

(f) These reports to be sent to the central office of the state and there tabulated for the state as a whole.

(g) These state reports should be sent to the national central office and there tabulated for the nation in order that we may have national statistics on this work.

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SANITARY MOISTENERS FOR POST OFFICE LOBBIES.

WARREN E. FORSYTH,

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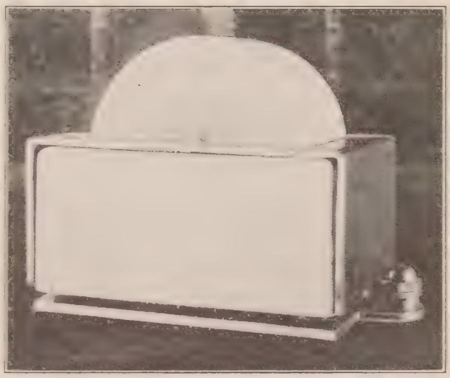
The common custom of licking stamps must have struck many as being insanitary. This is particularly noticeable in the lobby of almost any post office. The repeated offense of the writer's sanitary sense in this manner caused him to direct the installation of two suitable moisteners in a postal sub-station frequented by students of the University of Michigan. The moisteners were installed by the University Health Service and are kept in order willingly by the post office officials. The observed popularity of the moisteners prompts me to suggest their more general use. They might well be supplied to all post offices as part of their equipment. The accompanying clipping suggests a layman's notion of the danger of licking stamps.

BENTON HARBOR, MICH., Jan. 26.—Charles Pease, of this city, lies at the point of death from poisoning by mucilage on envelopes. Mr. Pease is suffering from a badly swollen mouth and throat. He had a dozen letters to mail and after moistening six of them noticed his tongue was burning and the muscles of his throat became paralyzed.



THE MOISTENER.

The common porcelain roller mounted in a porcelain trough was used. To prevent its undesired removal or accidental disturbance it was secured to the lobby table. The roller and trough are secured by a metal cover and bolts requiring a special wrench for their removal. The moisteners can be easily removed for an occasional cleaning. Water or other suitable solution can be added without removing the holder.

A STUDY OF PELLAGRA IN THE MORTALITY EXPERIENCE OF THE METROPOLITAN LIFE INSURANCE COMPANY, 1911–1916.

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Read before the Annual Meeting of the American Public Health Association, Section on Vital Statistics, Washington, D. C., October 19, 1917.

IN recent years pellagra has very rapidly increased in importance as a cause of death. This and the still unsettled question as to the causes of the disease, both strongly suggest the need for further statistical study of the facts that are at hand. By displaying some of the characteristics of the disease such as its relative prevalence as a cause of death among white and colored people or with reference to the two sexes or at the several age periods, it is possible for the statistician to aid the laboratory and clinical experts in their efforts. The statistical experience of the Industrial Department of the Metropolitan Life Insurance Company is especially valuable in this connection. The operations of the Company cover a very large part of the pellagrous area of the country. In all, several million lives in the cities and towns of the southern states are included, white as well as colored persons, males as well as females, children as well as adults. Every group of the population, excepting infants under one, is fully represented. Every death that occurs, moreover, in this experience is adequately and fully reported as to cause, color, sex and age, and the corresponding facts of the living population, that is, of the insured persons, are known with a completeness which is difficult to obtain in population vital statistics. It is possible, therefore, to present a series of tabulations giving death-rates for pellagra by color, sex and age period. The data, moreover, cover a period of six years, from 1911 to 1916, during which time pellagra has greatly increased in its incidence.

In this experience 2,310 deaths from pellagra are recorded. Table I presents the death-rates per 100,000 exposed, classified by color, sex and age period.

The combined death-rate, 4.3 per 100,000 exposed, is about the same as for angina pectoris and ulcer of the stomach and is higher than for any one of many diseases or for conditions which are universally recognized as important causes of death; for example, erysipelas, malaria, Pott's disease, general tuberculosis, the deadly epidemic cerebrospinal fever, epilepsy, gallstones, and others. Yet it is only a comparatively few years ago when a death from pellagra was considered a rarity in this country. In 1900, only two deaths from this disease were recorded in the Registration Area of the United States.

PELLAGRA MORE PREVALENT WITH ADVANCING AGE.

Table I indicates clearly that pellagra has its lowest incidence as a cause of death in the ages of childhood; in fact, the number of deaths among white children under 15 is negligible. Colored children show a larger number of cases. After age 15 the rates increase regularly until the age period 55 to 64 years is reached. From this point onward the rate falls slightly. It is, of course, possible that the data after age 65 have not the same merit as for the previous age periods because of the smaller number of persons exposed at these ad-

TABLE I.

MORTALITY FROM PELLAGRA CLASSIFIED BY COLOR, SEX AND AGE PERIOD —DEATH-RATES PER HUNDRED THOUSAND, 1911–1916.

Experience of Metropolitan Life Insurance Company—Industrial Department.

Age period	Persons	White		Colored	
		Males	Females	Males	Females
All ages..................	4.3	1.6	3.9	6.4	20.7
1– 4....................	.4	.2	.5	2.3	1.5
5– 9....................	.3	..	.2	2.3	3.5
10–14....................	.6	.2	.5	2.7	3.4
15–19....................	.9	.3	.9	1.3	6.2
20–24....................	2.8	.3	2.5	2.3	19.8
25–34....................	5.5	1.4	4.8	4.6	24.5
35–44....................	8.9	2.9	8.4	8.8	31.1
45–54....................	9.2	4.1	8.1	15.3	30.9
55–64....................	13.0	10.9	10.1	19.2	39.2
65–74....................	11.9	10.3	8.8	21.7	41.1
75 and over..............	10.1	9.9	5.0	41.2	45.4

vanced ages. In any case it is significant that each of the color and sex groups, almost without exception, shows during the main period of life a higher incidence of pellagra as a cause of death for each advancing age period.

Pellagra More Prevalent among the Colored.

The colored race in the insurance experience shows uniformly a higher incidence of pellagra than does the white. This is true at every age period and for both sexes. In fact, the rate is four times as high for the colored males as for the white males, all ages combined, and more than five times as high for the colored females as for the white females. This condition is in large part the result of the different geographic distribution of the white and colored policyholders. The greater proportion of the colored policyholders reside in the southern states where pellagra is common, whereas the majority of the white policyholders reside in the northern states where pellagra is still a rarity. There is, nevertheless, a real excess in the mortality rate among the colored as is shown by the figures for a number of representative southern cities and towns where pellagra has been prevalent for a number of years. This we shall note later. (See Table V.)

Pellagra More Prevalent among Females.

The rate for females is higher than for males both among the white and the colored. This is found at virtually every age period. The greatest difference is observed among the colored people where at each age period the rate for females is a number of times higher than the rate for males. It would be very interesting to learn why females in this country have approximately three times the pellagra mortality rate of males, since in a number of other countries where pellagra has been prevalent, no such relation between the sexes has been observed. In Italy, for example, the rate for 1913 was higher for males than for females. Roumanian and Egyptian statistics show no large excess of female pellagra deaths.

INSURANCE AND POPULATION EXPERIENCE COMPARED.

It is desirable to compare the above findings for the policyholders of the Metropolitan with those for the population of the Registration Area of the United States.

TABLE II.

MORTALITY FROM PELLAGRA CLASSIFIED BY SEX AND AGE PERIOD—DEATH-RATES PER HUNDRED THOUSAND.

EXPERIENCE OF UNITED STATES REGISTRATION AREA, 1910–1915 AND METROPOLITAN LIFE INSURANCE COMPANY, INDUSTRIAL DEPARTMENT, WHITE LIVES, 1911–1916, COMPARED.

Age period	Registration Area		Metropolitan	
	Males	Females	Males	Females
All ages	1.1	2.8	1.6	3.9
1– 4	.2	.3	.2	.5
5– 9	.3	.3	...	.2
10–14	.2	.4	.2	.5
15–19	.2	1.0	.3	.9
20–24	.5	2.4	.3	2.5
25–34	.9	3.7	1.4	4.8
35–44	1.4	5.2	2.9	8.4
45–54	2.3	4.9	4.1	8.1
55–64	3.8	5.4	10.9	10.1
65–74	3.8	4.9	10.3	8.8
75 and over	3.4	3.7	9.9	5.0

Table II presents the data for the Area for the six year period 1910 to 1915. This population experience contains but a small proportion of colored lives and the comparison may best be made with the experience for white lives in the Metropolitan. The rates for all ages combined are distinctly lower for both sexes in the population than in the white insurance experience. Considered by age periods, we find that under age 15 the rates are low and the differences between the two sets of figures are not so marked. After age 15 the population figures increase, but are considerably lower than those of the insured at virtually every age period for each of the two sexes. This condition is clearly explained by the fact that the Registration Area contains only a small section of the South where pellagra is prevalent whereas the Metropolitan experience covers a very considerable portion of this part of the country. A detailed examination of Table II nevertheless, presents some very interesting similarities in the two experiences. In the first place, with but few exceptions, females in both cases show higher rates than do males. Secondly, the rates increase with advancing age. In spite of their differences, therefore, the two sets of data confirm one another in a number of essential respects. If they do not correspond more closely in details it is because they refer to different geographical areas.

The above conclusion is confirmed by the similar distribution by age of the deaths from pellagra in the two experiences as shown in Table III.

The two distributions are remarkably

TABLE III.

DISTRIBUTION BY AGE OF DEATHS FROM PELLAGRA, 1911 TO 1915.

METROPOLITAN INDUSTRIAL EXPERIENCE AND REGISTRATION AREA COMPARED.

Age period	Metropolitan		Registration Area	
	Deaths	Per cent of total	Deaths	Per cent of total
All ages	1942	100.0	6694	100.0
1–14	74	3.8	264	3.9
15–19	52	2.7	193	2.9
20–24	136	7.0	491	7.3
25–34	394	20.3	1326	19.8
35–44	453	23.3	1565	23.4
45–54	355	18.3	1214	18.1
55–64	340	17.5	947	14.1
65–74	120	6.2	516	7.7
75 and over	18	.9	178	2.7

alike. It is only after age 55 that differences make themselves felt and these are the result in all probability of the very different age constitution of the living in the two groups; the proportion of policyholders after age 55 is very much lower than is the corresponding group in the population. For the main period of life, however, there is virtual correspondence, and we may conclude therefrom that the insurance experience for pellagra is representative of the condition prevailing in the general population. In no other way can we explain the close correspondence in the distribution of the deaths in the two series, having in mind that they are independently developed and cover different geographical areas. By considering the deaths alone in the two series we eliminate important sources of difference and are able to observe the essential similarity between the two groups. It is suggested that if the insurance experience coincided geographically with that of the population, the two sets of death rates would probably be in as close agreement as are the distributions of the deaths by age period.

INCREASE IN PELLAGRA IN RECENT YEARS.

It is only in recent years that pellagra has attained importance as a cause of death in the United States. Even as late as 1908 there were only 23 deaths from pellagra reported to the Census Bureau and all of these occurred in southern cities. Each succeeding year has shown, however, an increasing number of deaths. By 1910, pellagra had spread throughout the South and its appearance in many northern cities had become the subject of much comment in both the medical and the lay press. In 1911 the Census mortality report showed 654 pellagra deaths, an increase of 79 per cent over the number who died in the preceding year. In that same year, 277 deaths were registered in the Metropolitan experience alone. Table IV presents the experience of the Company and of the Registration Area, from year to year since 1911.

Because the Registration Area is a variable one it is believed that the mortality rate from pellagra among the industrial policyholders of the Metropolitan

TABLE IV.

MORTALITY FROM PELLAGRA, ALL AGES COMBINED, 1911 TO 1916—DEATH-RATES PER HUNDRED THOUSAND.

METROPOLITAN INDUSTRIAL EXPERIENCE AND REGISTRATION AREA COMPARED.

Year	Metropolitan		Registration Area	
	Deaths	Rate per 100,000	Deaths	Rate per 100,000
1911	277	3.6	654	1.1
1912	233	2.8	671	1.1
1913	290	3.3	1005	1.6
1914	492	5.3	1538	2.3
1915	650	6.7	2826	4.2
1916	368	3.6	2390	3.3

Life Insurance Company forms a better basis for noting the spread of this disease than do the population figures. This experience shows a decline in the year 1912 and a rapid and marked increase between the years 1912 and 1915 inclusive. In 1915 the total deaths reached 650 with a death-rate of 6.7 per hundred thousand exposed. It is of the greatest interest, therefore, to observe that in 1916 the number of deaths dropped to 368 and the death rate to 3.6, a decline in the rate of 43 per cent.

In general the picture presented by the Registration Area experience is similar. The year 1912 shows no change over the preceding year but thereafter there is, as in the insurance experience, an increase year by year including 1915 when the maximum rate of 4.2 was attained. The rate fell in 1916 to 3.3 per 100,000 living. Again we find a very marked parallelism in the tendency of the two sets of figures.

The reduction in the rate in 1916 is observed with but a few exceptions in every southern district where the Company operates. Table V presents the facts for a group of districts where the Company has a large number of persons insured and where pellagra has been a common cause of death in recent years. Both the white and the colored policyholders show a marked reduction in the rate for 1916. In some districts, no deaths from this cause were recorded in 1916.

Reports which have reached us from the health authorities of the southern states show, in general, an agreement with the insurance figures as to the trend of pellagra in recent years. Table VI presents the number of deaths and the death-rates for a number of southern states for the years 1914, 1915 and 1916. It is to be expected, therefore, that when the full mortality report of the Census Bureau for 1916 appears, the condition indicated by the Metropolitan's experience will be found to have prevailed throughout the population of the southern registration states.

TABLE V.

MORTALITY FROM PELLAGRA IN SELECTED SOUTHERN DISTRICTS, BY COLOR, 1916 AND 1915—DEATH-RATES PER HUNDRED THOUSAND.

Experience of Metropolitan Life Insurance Company—Industrial Department.

Area and district	1916		1915	
	White	Colored	White	Colored
Entire Metropolitan experience	2.2	14.2	4.0	22.8
Southern districts combined	44.7	82.1	86.3	121.0
Atlanta, Ga.	34.6	87.1	80.8	109.4
Augusta, Ga.	57.0	71.4	84.4	132.7
Columbus, Ga.	75.9	185.0	210.8	461.3
Macon, Ga.	54.2	68.0	90.8	77.0
Savannah, Ga.	*	45.1	78.4	94.2
Charlotte, N. C.	75.8	63.0	97.2	126.0
Greensboro, N. C.	20.6	65.9	59.7	124.3
Raleigh, N. C.	18.0	159.8	60.5	134.8
Columbia, S. C.	99.6	82.5	171.3	183.7
Spartanburg, S. C.	30.6	*	145.3	241.5
Chattanooga, Tenn.	40.1	33.2	68.5	116.4
Knoxville, Tenn.	67.3	60.2	94.4	74.1
Memphis, Tenn.	6.5	107.6	40.1	112.2
Nashville, Tenn.	46.1	49.7	38.7	47.6

(*) No deaths reported.

TABLE VI.

MORTALITY FROM PELLAGRA IN SELECTED SOUTHERN STATES, 1916, 1915 AND 1914—DEATHS, AND DEATH-RATES PER HUNDRED THOUSAND.

Data Furnished by State Registrars.

State	Deaths			Death rate per 100,000 population		
	1916	1915	1914	1916	1915	1914
Kentucky	120	148	144	5.0	6.2	6.0
Mississippi	840	1535	1201	42.9	79.6	63.1
Virginia	249	332	250	11.3	15.3	11.6
Maryland	3	15	7	.2	1.1	.5
North Carolina	467	831	551*	19.4	35.0	23.6
Alabama	677	1109	819	29.0	48.2	36.1
Louisiana	295	301	...	16.1	16.7	....

* Low number probably due to fact that registration was not complete in 1914, having just begun in that year.

ON THE BACTERICIDAL EFFICIENCY OF SOAP SOLUTIONS IN POWER LAUNDRY.

H. G. Elledge
and
W. E. McBride.*

ONE of the first problems presented for study to the Industrial Fellowship on laundering, in operation in the Mellon Institute of Industrial Research, was the sanitary condition of the goods delivered from power laundries to their patrons. This problem has received intensive investigation by one of us (H. G. Elledge) during the past two years, and the practical observations and conclusions obtained thereby have recently been supplemented by the joint inquiry reported in this communication.

The views respecting this important subject which have appeared in the literature are illustrated by the statement of Wile† that, in the usual power laundry process, exposure to the heat and customary reagents, along with the mechanical agitation, destroys the hardiest of bacteria, and that "laundering as practiced in the better class of power laundries appears to be an efficient hygienic method of promoting cleanliness, without danger to patrons and with comparative safety for the employee."

In August, 1915, in order to confirm the conclusions given in and derived from the literature and to establish evidence which might be acceptable in court concerning a matter which, at that time, was of peculiar interest to the laundry industry, a number of tests were carried out in the senior author's laboratory. The results of this experimental work were presented to the Laundryowners' National Association in a special report and more briefly in a contribution to the technical press.*

A conclusion presented therein, namely, that the electric current, per se, has no germicidal value,† is of secondary interest here; but certain of the other findings are of importance in their relation to the subject discussed in this paper. Particular reference is had to the conclusion that the real sterilizing factors in the washing process are the heat of the various baths; the solutions of soap and weak alkalies, even at temperatures as low as 120° F.; hypochlorite solutions, when used; and the temperatures of the ironers, the dry-rooms, the hot-air tumblers, and the heated drying forms.

Subsequently to this, there appeared an article on "Laundries and the Public Health,"‡ conforming all of the conclusions stated above in every particular, except those regarding the value of hypochlorite and soap solutions at low temperatures. The value attributed to hypochlorites by the authors of the paper mentioned is especially out of harmony with the evidence found so abundantly in the works of other investigators, and in the approved practice of sanitary engineers. Specifically, Lederer and Bachmann* found that the percentage reduction of various micro-organisms by 15 minutes contact with one part of available chlorine in 10,000,000 parts of water was 99.98 per cent, and with 5 parts of available chlorine in 10,000,000 parts of water, 100 per cent. For effective and comparatively harmless bleaching† in laundry practice, a concentration of available chlorine of one thousand times that mentioned above is required (viz., one part in ten thousand parts of water). The effectiveness of hypochlorite in treating municipal water supplies, as well as in medical practice,‡ is so firmly established that further investigation appears to be uncalled for. Another reason why it appears that the interests of the laundry patrons demand no further experimentation as to the value of this reagent is that all fabrics that may receive the bleaching treatment are ironed or dried at a high temperature and are, consequently, by any one or all of these means, completely sterilized.

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* The authors are indebted to Dr. A. B. Wallgren, of the Department of Biology of the University of Pittsburgh, for his courteous interest during the course of this investigation.

† *Medical News*, December 3, 1904.

* *Electrical Review and Western Electrician*, August 19, 1916.

† Confirmed by Chas. E. Marshall; see Marshall's "Microbiology," 166.

‡ "Laundries and the Public Health," by M. C. Schroeder and S. G. Southerland, *U. S. Public Health Report*, February 9, 1917.

The question of the bactericidal value of soap solutions at a temperature of about 120° F. is, however, of vital interest, because woolens and some fabrics of fugitive dyes should not be washed in baths exceeding this temperature and in many instances requires slow drying at room temperatures. Fortunately, woolen body garments are coming to be less commonly worn than in former times, but the washing of the vast number of blankets for hotel, Pullman and steamship service presents a sanitary problem, depending largely on the bactericidal value of soap.

The most notable investigation of the bactericidal value of soap solutions was conducted by Rodet,* who, after noting the conflicting reports on this question, explained that many of the discrepancies observed might be accounted for by variations in technic and in the statements of the actual concentrations of soap used. In the data which Rodet presents, he shows that strips of linen dipped in cultures of cholera, dysentery, and coli, and then coated with egg albumen, were sterilized at the end of one hour by being immersed in a solution of 4 per cent soap of Marseilles (probably a 2½ per cent concentration of anhydrous soap) at a temperature of 45° C. Other bacteria proved to be more resistant, but Rodet noted that, in all cases, there was a decided attenuation and that concentrations as low as three parts per ten thousand inhibited the growth of cultures in beef-broth. He concluded that soap solutions have a very real value as bactericidal agents.

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* Lederer, A., and Bachmann, F., in a paper read before the Illinois Water Supply Association, *Engineering Record*, 65, 360–362 (1912).

† That is, compared to the effect of other parts of the washing process, such as mechanical wear, etc. See Elledge, "Conservation of Textiles in Laundering," *Scientific American Supplement*, July 14, 1917, 30.

‡ For instance, in the Carrel Treatment of wounds.

* A. Rodet, Professor of Microbiology, University of Montpelier, "Valuer antiseptique du Savon," *Revue de Hygiene, 1905*, 301.

In view of the facts presented above, the following experiments seemed desirable for definitely ascertaining the efficiency of soap solutions of concentrations practically employed in laundering woolens, together with the added effect of the agitation afforded by the power-driven washer. The tests as described below were carried out in a laboratory model of the usual type of commercial washers, under conditions obtaining in the washing of woolen garments in laundries.

Description of Experimental Work

In the first series of tests, the organism used was *B. subtilis* because of its high resistance to heat and germicides.

It was thought that if it would be possible to kill *B. subtilis* with a reasonable exposure to soap solutions, then it would not be necessary to use other bacteria which might be found on soiled clothing, whose resistance is less than that of *B. subtilis*.

The first series of tests was carried out as follows:

Strips of cloth inoculated with large numbers of *B. subtilis* and similar sterile strips were placed in the washer with some woolen clothing. This batch was then rinsed with water having a temperature of 40° C., for five minutes. This water was drained off and replaced by clean water of 40° C. temperature. After introducing 200 grams of soap into the machine, the clothes were washed for 15 minutes, after which they were given three rinses with clean water at 40° C., to remove the soap. The number of bacteria was counted from samples of the tap water; the water in the washer at the end of the first rinse; the water at the end of the last rinse; and from infusions made from the inoculated and sterile strips in 300 cc. of sterile water after the strips had been dried in a centrifugal drier. The following tables give the results of the enumeration of three tests as above described:

Organism	B. subtilis	8 gal. water	Temp. 40° C.	200 grams of soap
No. in tap water	No. at end of first rinse	No. at end of last rinse	Infusion of inoculated strip	Uninoculated strip
30 per cc.	700 per cc.	175 per cc.	1,800	24
34	500	75	1,000	10
27	1,100	68	260	6

The results show that a considerable number of bacteria were not killed and remained in the cloth and also that the sterile strips became contaminated through the medium of the water. Small pieces of the uninoculated strips were taken after the infusion was made and plated in agar. After incubation, they developed six to fifteen colonies per square centimeter, showing that it would be impossible to remove all the bacteria from the clothing; hence a reasonably accurate enumeration could not be obtained by this method.

The next experiments were carried out in a different manner. The usual amount of water at 40° C. was run into the machine. Then large numbers of *B. subtilis* were introduced into the water. After running the machine for 30 seconds to diffuse the organisms thoroughly, a sample of the water was taken to obtain the number of bacteria per cc. which was present. Then 200 grams of soap were put in, but no clothes were introduced into the machine. After a 20-minute run, a sample was again taken. An average of four such experiments gave a reduction of 56 per cent of the number of bacteria introduced. By the same method, it was found that, without using soap, a reduction of 41 per cent took place.

The same tests were also applied to *Micrococcus pyrogenes aureus* and *B. coli*. The samples were taken at 15 and 30 minutes. The following tables give the results obtained:

Organism Mic. p. aureus Soap 200 grams to 8 gal. water Temperature 40° C.

Start	15 minutes washing	% Reduction	30 minutes washing	% Reduction
9,000 per cc.	460 per cc.	94.9	330 per cc.	96.3
10,180	140	98.6	0	100.0
11,000	50	99.5	30	99.7
23,250	1,560	93.3	1,400	93.9
1,900	100	94.7	60	96.8
		Average 96.2		97.3

(Additional tables are on page 498.)

CONCLUSIONS.

The results of these experiments indicate that an infusion method for testing the bactericidal effect of any agent on an inoculated piece of cloth must not be considered to give more than a relative indication of the actual number of organisms present; that a count on the effluent from any washing bath does not give a true indication of the quantity of organisms remaining in the clothes being washed; and that plating a portion of the cloth in question in agar gives a more positive indication.

They also show that soap solutions at a temperature of 40° C. have a real bactericidal value.

Results with B. subtilis.—The churning of the water in the washing machine reduces *B. subtilis* 47 per cent without soap, and 64 per cent when subjected to the action of a soap solution of one part of anhydrous soap in 1,450 parts of water.

Results with Mic. p. aureus.—*Mic. p. aureus* was reduced 62.7 per cent in 15 minutes and 79.4 per cent in 30 minutes without soap; but when soap was used, the reduction amounted to 96.1 per cent after an exposure of 15 minutes, and 97.3 per cent after 30 minutes.

Results with B. Coli.—The action on *B. Coli* was nearly the same. Without soap, there was a reduction of 59.5 per cent in 15 minutes and 76 per cent in 30 minutes. With soap (one part to 1,450 parts of water), the reduction

Organism Mic. p. aureus No soap 8 gal. water Temperature 40° C.

Start	15 minutes washing	% Reduction	30 minutes washing	% Reduction
12,000 per cc.	7,120 per cc.	41	2,200 per cc.	81.6
23,250	9,900	57	4,600	80.2
15,260	5,200	66	3,000	80.3
22,300	6,000	70	42,000	81.1
		Average 58		80.8

Organism B. Coli Soap 200 grams 8 gal. water Temperature 40° C.

Start	15 minutes washing	% Reduction	30 minutes washing	% Reduction
13,680 per cc.	510 per cc.	96.3	180 per cc.	98.7
15,000	560	96.3	220	98.6
27,000	1,300	95.2	900	96.7
		Average 95.9		98.0

Organism B. Coli Soap 100 grams 8 gal. water Temperature 40° C.

Start	15 minutes washing	% Reduction	30 minutes washing	% Reduction
35,100 per cc.	6,500 per cc.	81.8 per	2,300 per cc.	93.4
17,500	3,300	81.2	2,350	86.6
5,870	1,250	78.8	940	84.
		Average 80.6		88.

Organism B. Coli No soap 8 gal. water Temperature 40° C.

Start	15 minutes washing	% Reduction	30 minutes washing	% Reduction
15,260 per cc.	5,200 per cc.	65.9	3,000 per cc.	80.3
22,500	10,480	53	6,220	72.1
6,800	2,720	60	1,640	75.9
		Average 59.6		76.1

was 95.8 per cent in 15 minutes and 97.9 per cent in 30 minutes. When one part of soap to 2,900 parts of water was used, the reduction of the bacterial count was 78 per cent in 15 minutes and 87.8 per cent in 30 minutes.

Considering the omnipresence of organisms that, under certain conditions, may be considered pathogenic, it appears absurd to demand that a clothes-washing process should render fabrics absolutely sterile; but it has been demonstrated that such results are actually obtained in the case of all garments that are finished by ironing or drying at high temperatures, and that, in the case of those not so treated, the washing with soap produces a bactericidal efficiency comparable to that obtained by pasteurization.

THE EFFECT OF PLANKTON ANIMALS UPON BACTERIAL DEATH-RATES.

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and
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Read before the Laboratory Section, American Public Health Association, October 19, 1917, Washington, D. C.

REPEATED observations by careful investigators seem to indicate that the rapidity of bacterial reduction in polluted water and sewage is not satisfactorily explained by the activity of the inhibitive agencies usually cited. Several eminent workers have frankly stated that an additional important agent of bacterial destruction is found in certain aquatic protozoa.

Comparatively recent studies establish the coincident presence of certain protozoa, with heavy pollution and high bacterial content, also the scarcity of these same protozoa when bacterial count is low. Whether these abundant protozoa are finding their chief food in the bacterial flora, or in the non-living suspended organic matter present, has apparently remained an unsettled question, although seemingly a matter of no small import in the study of Nature's methods of water purification.

It was, therefore, desirable to know (1) whether these protozoa will thrive if bacteria be absent, (2) whether bacterial history will be affected if no protozoa be present, and finally (3) whether, in a culture containing both protozoa and bacteria, either form of life will show any definite effects seemingly due to the presence and activity of the other form.

In accordance with these conditions cultures of sterile sewage were run, bacterial inoculation being by stock suspension of typical river and sewage forms, and, except as stated hereafter protozoa were used in pure culture. Cultures designated "Series 1" contained protozoa but no bacteria, "Series 2" contained bacteria but no protozoa, and "Series 3" contained both bacteria and protozoa. Information was thus sought as to the behavior of protozoa when bacteria are absent, the history of bacteria when protozoa are absent, and lastly bacterial history and coincident protozoan history when both are present in the same culture. All cultures, in 300 cc. flasks, were incubated in darkness at 20° C.

In Chart I, culture 45 (dotted line) is bacteria only. No protozoa are present. Maximum of nearly 400 million per cc. is reached in two days, followed by gradual decline until fifty-fifth day. In identical culture (42) differing only in that *Colpidium* (a minute ciliate) were added with the bacteria,—the bacterial count (light line) reaches a lower maximum of 200 million in one day, followed by very rapid decrease until the protozoa had practically disappeared, when there was a sudden increase of bacteria. In this same culture, the protozoa (heavy

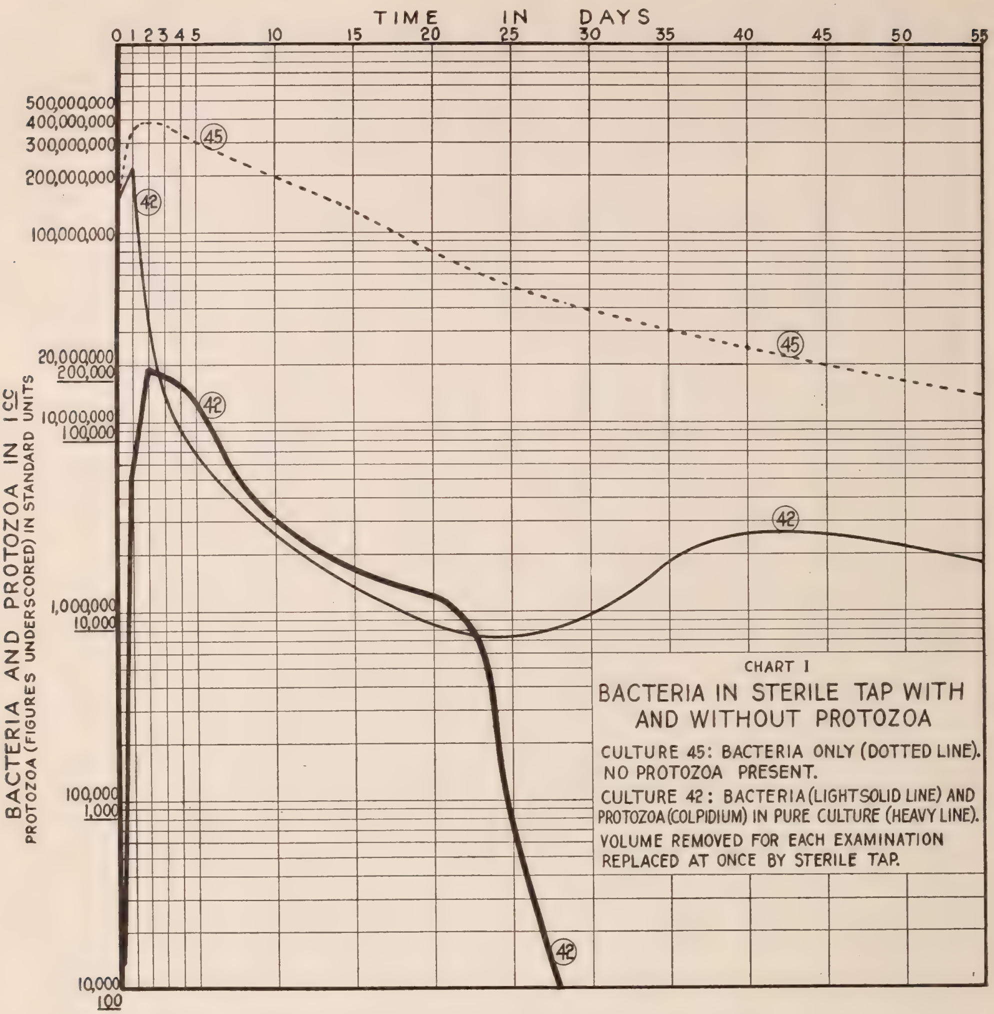


CHART I

BACTERIA IN STERILE TAP WITH AND WITHOUT PROTOZOA

CULTURE 45: BACTERIA ONLY (DOTTED LINE). NO PROTOZOA PRESENT.

CULTURE 42: BACTERIA (LIGHT SOLID LINE) AND PROTOZOA (COLPIDIUM) IN PURE CULTURE (HEAVY LINE).

VOLUME REMOVED FOR EACH EXAMINATION REPLACED AT ONCE BY STERILE TAP.

line) meantime increase rapidly at the time of greatest bacterial reduction. It is to be noted that the bacteria are more reduced in this culture in five days than they are in fifty-five days in the companion culture (45) which contains no protozoa.

The curves here shown were affected somewhat by dilution caused in replacing, with sterile media, the amount removed at each examination. This was not done in subsequent cultures.

In Chart II, culture 58, containing bacteria only (dotted line), the count reached approximately 500 million in two days and maintained this high content for about thirty days, then decreased slowly. Control culture 59, identical except for the addition of 15 *Paramæcia* to the 150 cc. of media used, showed similar bacterial history (light line) for five days, during which time the protozoa (heavy line) had increased remarkably. The bacterial

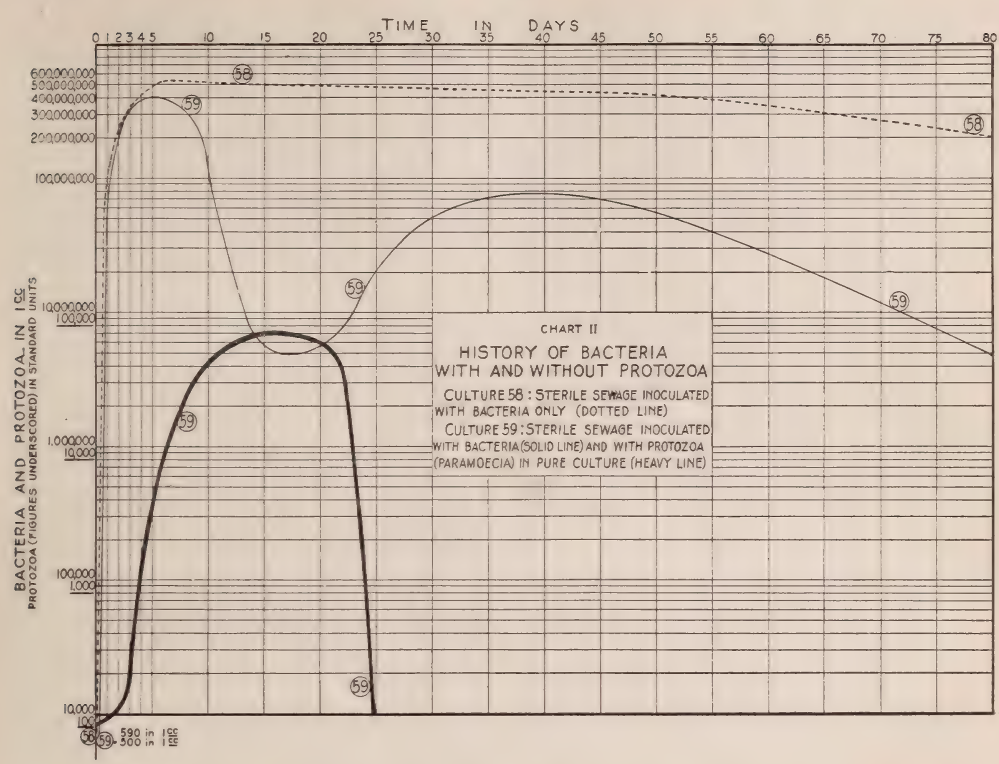


CHART II

HISTORY OF BACTERIA WITH AND WITHOUT PROTOZOA

CULTURE 58: STERILE SEWAGE INOCULATED WITH BACTERIA ONLY (DOTTED LINE)

CULTURE 59: STERILE SEWAGE INOCULATED WITH BACTERIA (SOLID LINE) AND WITH PROTOZOA (PARAMOECIA) IN PURE CULTURE (HEAVY LINE)

count now broke abruptly and decreased until the protozoa had diminished to small numbers, whereupon the bacteria developed a secondary rise.

Chart III shows results apparently practically identical with the foregoing,—but with this difference, viz., bacterial content shows a small secondary rise, and after fifty-five days a third increase develops. Meantime the protozoa (heavy line) did not die out, though reduced to small numbers. It is to be noted that the protozoa show a secondary rise coincident with the secondary reduction in bacterial content.

Unusual interest attaches to the behavior of protozoa (Paramœcia) in a culture entirely free from bacteria. This unusual environment for this typical sewage organism was secured, after many failures, by obliging the Paramœcia to swim through a *Marathon bath* of nearly thirty feet of sterile water. Subsequent handling was done with elaborate precautions to prevent contamination. Two flasks of sterile sewage were inoculated with 12 Paramœcia each. Two check cultures of sterile sewage were inoculated with 3 Paramœcia each, but to these latter cultures heavy bacterial inoculation was added as food for the Paramœcia. Results were as follows:

After 6 days one flask showed bacteria in large numbers. Paramœcia in this same culture increased nearly 100-fold in 14 days. The second flask gave

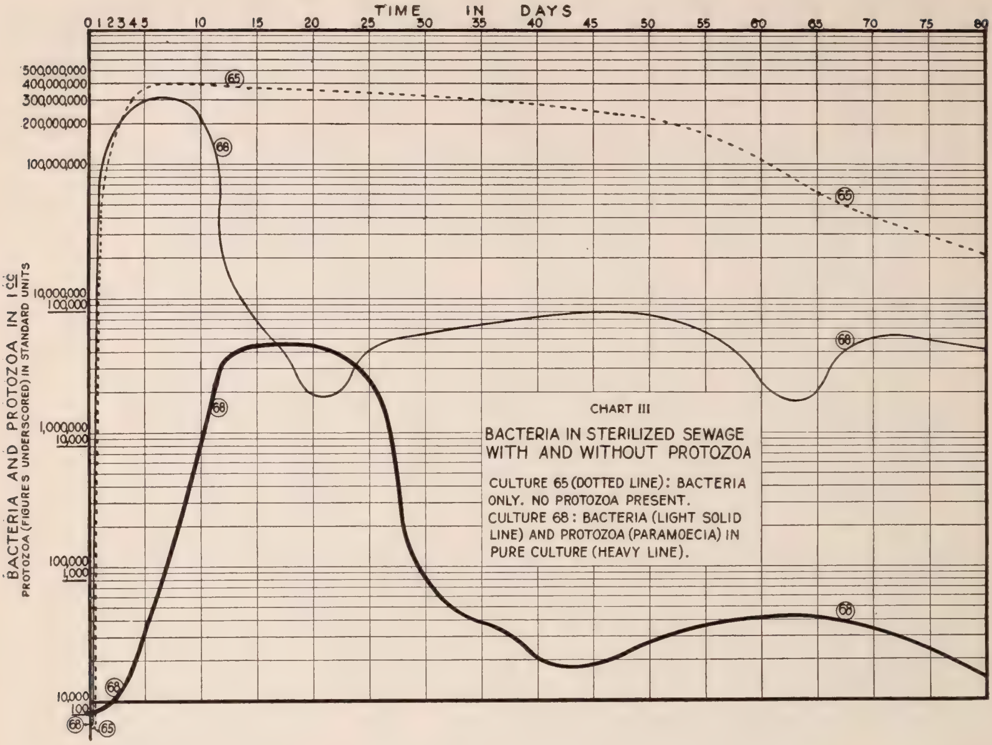


CHART III

BACTERIA IN STERILIZED SEWAGE WITH AND WITHOUT PROTOZOA

CULTURE 65 (DOTTED LINE): BACTERIA ONLY. NO PROTOZOA PRESENT.
CULTURE 68: BACTERIA (LIGHT SOLID LINE) AND PROTOZOA (PARAMOECIA) IN PURE CULTURE (HEAVY LINE).

sterile plates at 6 days, 8 days, and 14 days, but Paramœcia all died before the 4th day. Both check cultures, containing large numbers of bacteria, showed heavy increase in Paramœcia.

It was thought possible that death of protozoa in the sterile culture might be due to some unfavorable condition of the media (sewage) developed, perhaps, in the process of sterilization in autoclav. Accordingly after 14 days' sterility this identical media was reinoculated with 12 Paramœcia from the same stock culture which had supplied the first ones, the only difference being that these last ones were not elaborately cleansed by "Marathon bath." With this second protozoan inoculation, however, there was added a heavy inoculation of bacterial suspension. These results were noted:

Bacteria increased from initial content of less than 2 millions to over 16 millions in 48 hours, then fell to 8 millions in 96 hours with further decrease to 270,000 per cc. on 30th day. Meantime Paramœcia with initial content of 1 in 10 cc. increased to 3 per cc. in 48 hours, to 43 per cc. in 96 hours reached maximum of 334 per cc. in 8 days with subsequent slow decrease to 27 cc. in 30 days.

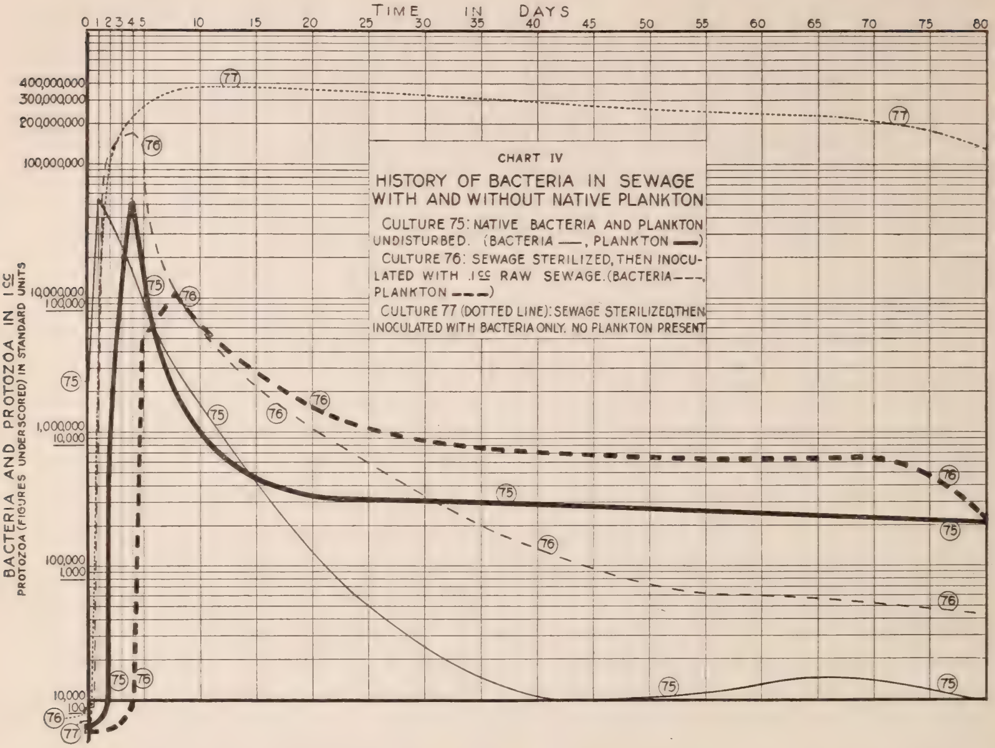
These results seem to indicate (1) that it is possible to free Paramœcia from all bacteria; (2) that these Paramœcia are unable to live in sterile sewage, though non-living suspended organic matter is abundant; (3) that other Paramœcia, which have had identical treatment live and multiply in an identical culture which, however, becomes contaminated and develops high bacterial content; (4) that in check cultures, Paramœcia which have received identical treatment live and multiply enormously if heavy bacterial inoculation be added at the start; (5) that the identical culture medium in which Paramœcium could not survive when bacteria were absent, becomes favorable to growth and increase of Paramœcia *when bacteria are added;* (6) that the death of Paramœcia in sterile flask could not have been due to want of non-living suspended organic matter, for this was present; nor to injury resulting from the long "Marathon bath," for other Paramœcia subjected to this same treatment lived and multiplied in the other flask and in check cultures. Nor was death caused by unfavorable condition of sterilized media, for this identical media inoculated later with bacterial suspension enabled Paramœcia then introduced to live and multiply.

All preceding experiments were conducted with protozoa in pure culture, whereas under conditions as they exist in Nature a variety of animal forms, and sometimes of plant forms also, constitutes the native plankton. Such complexity of forms, and the varied activities and results produced thereby, might produce an aggregate effect on the bacterial content very different from the effects already recorded in cultures whose protozoa were limited to one kind only.

Information on this matter was furnished by cultures of sewage whose histories are shown in Chart IV.

In culture 77 (which contained no protozoa) bacteria repeat the history of similar cultures in previous experiments, reaching high maximum in the first few days and maintaining it for several weeks. In culture 76 (inoculated with 0.1 cc. raw sewage) similar initial bacterial content rises at same rate, but is arrested on reaching moderate maximum on 4th day and there follows a sudden decrease which continues less rapidly up to the 80th day. The only known difference between these cultures lies in the fact that while 77 contained bacteria only, 76 contained minute protozoa together with bacteria, both introduced by the 0.1 cc. raw sewage added. Greatest increase of protozoa in this culture was coincident with greatest bacterial reduction. It seems evident (a) that bacteria in culture 76 do not decrease as a result of their own growth, for the higher numbers in culture 77 do not thus decrease. Also (b) the long-sustained high bacterial content of 77 is not because of a better medium being produced by sterilizing the sewage: the sewage in culture 76 is also sterilized, but the addition of only 1 part of raw sewage in 1,500 of sterile serves to bring about the bacterial decrease in this culture.

In the untreated culture 75, which contained all its native plankton and bacteria, the latter reached low maximum in 1 day, broke sharply and decreased rapidly, then more slowly, until the count was very low. (This agrees with the history of a large number of similar stored sewage samples



examined at this laboratory.) Meantime the plankton increased to high maximum in 4 days, then broke sharply and decreased rapidly, then slowly.

Thus the two plankton-containing cultures, 75 and 76, show essentially similar bacterial history. Similar agreement is evident in plankton history also. It is to be noted that in neither case does plankton die out, as frequently happened when pure cultures of protozoa were used.

The greater anti-bacterial efficiency is shown by culture 75, which contains all its native plankton and bacteria. Increase of bacteria if checked in 1 day, the numbers rapidly decreased and finally reduced to 10,000 per cc., while in culture 76 (containing very minute plankton only, and in limited variety) bacterial increase continues unchecked until the 4th day, and is finally reduced no lower than 50,000 per cc. This seems to indicate that the anti-bacterial factor requires a time period to become effective which in general coincides with the time required for the plankton, introduced in very small amount, to increase to relatively large content.

In both cultures containing plankton there was distinct and permanent improvement in turbidity and odor in less than 10 days. In culture containing bacteria only, these physical conditions remained practically unchanged for 70 days.

This experiment as a whole tends to show that the varied living forms which constitute the native plankton of sewage collectively exercise the same anti-bacterial influence that is displayed by a pure culture of protozoa. It also seems evident that this influence is most efficient when all the natural plankton is present, as bacteria are then reduced to very low content. It thus seems that Nature's methods excel laboratory procedure.

All results of experiments as recorded tend, on the whole, to establish certain facts as follows:

(1) A sewage culture containing no protozoa, but containing bacteria only, shows high bacterial content attained in 2 to 6 days and maintained without material reduction for 6 to 15 weeks.

(2) A sewage culture containing *no bacteria,* but protozoa (Paramœcia) only, remains bacteria-free indefinitely but these protozoa die in a very few days.

(Owing to the great difficulty of eliminating *all* bacteria from the living Paramœcia—here accomplished for the first time, so far as known to the writers—only one culture was entirely successful.)

(3) A culture containing both bacteria and certain protozoa shows high bacterial maximum speedily and heavily reduced, with rapid increase in protozoa at time of greatest bacterial decrease. An apparently reciprocal but essentially direct relation seems to exist: The protozoan curve follows the bacterial, reproducing 2 to 6 days later the broad curves described by bacterial history. If protozoa die out, bacteria show a secondary rise.

(4) Untreated sewage containing all its native plankton and bacteria reaches medium bacterial maximum in 1 day, then a sudden decrease followed by gradual reduction to low values. Plankton meantime reaches high maximum in 3 or 4 days, breaks sharply and later decreases gradually following in general the bacterial curve.

(5) Certain protozoa that are usually abundant in sewage-polluted water are able to live and multiply enormously when no food except bacteria is available.

This proposition of fundamental importance is supported by the surprising multiplication of *Colpidium* in 12 cultures of sterile tap-water inoculated with bacteria from agar plates. (See Chart I.) Many additional cultures give evidence relative to the same fact.

It thus seems evident that the anti-bacterial influence exerted by certain protozoa is due to a food relation, and that these animals of the plankton therefore consume bacteria in large numbers. These protozoa are practically always present in sewage or water having high bacterial content; hence their food habits as suggested by environment, as suspected by many workers and observed by some, and as substantially confirmed by the definite records herewith submitted, will constitute a factor to be reckoned with in the biological disposal of sewage and purification of polluted water.

REPORT OF THE COMMITTEE ON STANDARD METHODS OF EXAMINING DISINFECTANTS.*

SECTION A. INTRODUCTION.

IN 1912 the Laboratory Section, A. P. H. A., adopted as the official standard method for the examination of disinfectants the procedure devised by Anderson and McClintick† with certain modifications relating chiefly to the phenol and the culture media. The committee report stated at that time:

"Since the publication of Bulletin No. 82 comparisons of the results of tests made by different members of the Committee upon duplicate samples have led to the belief that further studies may develop points of value in the further elaboration of the method which will tend to produce greater uniformity of results in the hands of different workers."

During the past two years the Committee on Standard Methods of Examining Disinfectants has been engaged upon such further studies looking toward the improvement of certain recognized defects in the present standard method.

Of the present membership only three have been in a position to do actual laboratory work. The Committee has been fortunate, therefore, in having secured the collaboration of Dr. Wilhelm Dreyfus, of the Chemical Department of the West Disinfecting Company, of Dr. E. M. Houghton, of the Park, Davis Research Laboratories, and of Mr. J. M. Weiss of the Research Department of the Barrett Manufacturing Company. It was therefore possible to arrange for the participation of the following laboratories in the comparative tests:—the Hygienic Laboratory of the U. S. Public Health Service, the laboratory of the Bureau of Animal Industry on behalf of the Federal Insecticide Board, the Lederle Laboratories on behalf of the West Disinfecting Company, and the Laboratories of Parke, Davis & Company, and of the Barrett Manufacturing Company. Mr. J. H. Wright of the Lederle Laboratories has been in part responsible for that Laboratory's contribution and has in addition made the special studies of the effect of acidity in media.

INVESTIGATIONS BY THE COMMITTEE.

Early in 1915 a comparative test was arranged whereby each of the five laboratories undertook to test two special disinfectants by both the R-W and the H-L procedures and by two techniques under each procedure, making eight tests in all. Each test was done in triplicate to obtain data upon the reliability of the various procedures. The first technique employed the ordinary phenol and organism used in the laboratory, the second, a special typhoid culture and synthetic phenol sent out by the Committee. The 120 results were submitted to a careful analysis and comparison. The following conclusions were drawn:

1. Under all procedures the agreement between the three check determinations was as close as the nature of the test permits *i. e.* within one dilution or one time interval.

2. In all cases the phenol values used in dividing were in equally good agreement as between the various procedures in the same laboratory, showing that no great part of the variation is attributable to variations in phenol or in organism.

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* This report was presented before the Laboratory Section, Oct. 20, 1917, and was accepted and ordered published, in order that it might come up for final adoption at the next meeting. Pending such final adoption it is not official.

† Anderson and McClintick, Hyg. Lab. Bull. No. 82, 1912.

3. Each laboratory showed a distinct "laboratory variation" whereby it tended to be uniformly higher or lower than the average of all five.

4. As between laboratories, the average deviation from the mean was, with one disinfectant (coefficient about 5), 10 per cent for the H-L method and 18 per cent for the R-W; with the second disinfectant (coefficient about 15), 6.5 per cent for the H-L and 14 per cent for the R-W; or approximately twice as great a discrepancy between the five laboratories when using the R-W method as when using the H-L (three of the laboratories regularly used the R-W method and four of them, the H-L).

5. The H-L method was; in the final average, 5 per cent higher than the R-W, on the one disinfectant and 11 per cent lower on the other.

In view of the showing of the work of these five laboratories, all skilled in disinfectant testing, it was concluded that some further changes were necessary in the technique in order to render it available for general use. Evidence had accumulated in the meantime that the media employed in the standard procedure were too acid for satisfactory results. Reports were received of difficulty of obtaining good growths in the broth and hydrogen ion determinations indicated excessive and variable acidity.

At this point Mr. Wright undertook a special study of this phase of the problem the results of which have already appeared in print.* He was able to demonstrate a definite dependence of the observed phenol coefficient upon the degree of acidity of the broth employed and also the advantage, in uniformity of results, of broth approximately neutral in true reaction. He also considered the suitability of certain American brands of peptone.

During 1916 a second extensive comparative test was planned and carried out by the same group of laboratories, the collaborating laboratories representing at this time, however, the Association of Disinfectant Manufacturers. The broth used was unadjusted and practically neutral, and some minor modifications were introduced in the method of preparing the typhoid culture. The results of this test were much more satisfactory. The average deviation from the mean for all H-L tests was 6.75 per cent and for all R-W tests 4.6 per cent. The work in this case was divided so that three laboratories worked with each test. With the range of phenol dilutions employed the successive dilutions vary by about 10 per cent which fixes the lower limit of error of single test. Three laboratories making three tests each should report an average deviation of about 3.3 per cent if all other sources of error are eliminated. It is probable, therefore, that the technique devised is free from sources of gross error and that no further refinement of technique will permit much greater accuracy than that reported. It is also worthy of comment that with the same media the two major methods are of approximately equal accuracy and furthermore that they yield results that are quite concurrent. For the whole series the H-L results are 1.5 per cent higher than the R-W, a figure well within the range of error between the laboratories and therefore without significance.

The study included also a comparison of Witte's and Armour's peptones and indicates a uniformly higher result with the former averaging about 7 per cent.

The recommended technique is based upon the results of these investigations.

The most important change that has been recommended is in the media employed. Our investigations in this direction have been referred to. The acidity of the media recommended by Anderson and McClintick is not only too high for satisfactory growth of the test organism, but is also extremely variable, not only among the several laboratories, but from time to time in the same laboratory. By the application of the newer views of acidity, as set forth by Clark and Lubs,* it has been found that media made without any attempt at adjustment are not only more suitable for the growth of the organism but are far more uniform and reliable.

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* Wright, J. H. Jour. of Bacteriology Vol. 2, No. 4, 1917.

The hydrogen ion concentration of the culture media is of the utmost importance and it is recommended that each batch of medium be tested for hydrogen ion by the colorimetric method described by Clark and Lubs.

It has been found that the hydrogen ion concentration most conducive to uniform results is approximately $P_H = 6.5$.† However, any medium made according to the formula recommended may be used provided the P_H value does not vary more than one-half unit from this figure. Several brands of peptone were studied in detail and of these, two, Witte's and Armour's, were tried in the comparative work done in the five laboratories.

It is recommended that Witte's peptone be used for all important work. The Committee's experience shows, however, that Armour's peptone gives results closely approximating those obtained by Witte's although somewhat lower, so that this product may be used for routine control purpose. It should not, however, be employed unless the hydrogen ion concentration of the finished medium falls between $P_H = 6$ and $P_H = 7$. Care should also be exercised in interpreting the results obtained with this peptone and too much reliance should not be placed upon such results unless the particular lot of peptone in question has been thoroughly tested and found to be in every respect comparable with Witte's peptone. So far as the work of the Committee has gone, no other brand of peptone may at present be substituted for Witte's. Several manufacturers, however, have recently made changes in their processes of manufacture. In every case the newer products have, with the small number of samples tested, given quite satisfactory results so that it is probable that other products may, upon further investigation, prove available. Some variation has been found in the meat extract, especially in the matter of acidity but there appears to be no satisfactory way of standardizing this product. The Committee wishes to point out the need for further studies upon peptones and meat extract and to invite the coöperation of other bacteriologists in the work.

It has been suggested as a possible solution of the difficulty of variable media that a stock of one or two disinfectants be carried at some central laboratory, such as the Hygienic Laboratory of the U. S. Public Health Service at Washington, and that specimens of these be submitted upon request with a full determination of the constants under the approved standard procedure. Such standard specimens would serve as a basis for the standardization of the technique and media of the individual laboratory, including also the strain of organism and the particular sample of phenol used. Such a program would involve among other things consideration of the permanence of the standard disinfectants selected. A still more desirable procedure would be the complete determination of the biological constants of another standard substance, capable of being prepared and kept in pure and permanent form and having a coefficient of from 3 to 5, and a concentration exponent other than 6. With such a second known standard available it would be possible for any laboratory to control its entire technique including all variables in organism or the composition of media. It would then be possible to make such minor changes as the substitution of another brand of peptone or extract in the media with assurance that the results would not be modified. A full investigation of this matter is now under way.

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* Jour. of Bact. II, 1917, pp. 1, 109, 191.

† The symbol, P_H, stands for the log. of the reciprocal of the hydrogen ion concentration, in terms of normal.

The studies of the Committee have indicated that slightly lower phenol coefficients are obtained with the new media than with the old. A change of this sort, while, in one sense, perfectly fair to all manufacturers, would be distinctly troublesome if it necessitated a change of labels and difficult explanations to customers. The slightly increased average time of testing has, therefore, been adopted not only to offset this reduction in coefficient, but also to give proper range to the time factor determination. By reasons of its great relative inaccuracy the 2.5 minutes test has been abandoned, and in order to economize both labor and materials, only those tests are completed which are required in the final computations.

Some studies of the constancy and reproducibility of the platinum loop have shown what has always been more or less obvious that as an instrument of even approximate accuracy, the loop is seriously deficient.

The new loop which is recommended was suggested to us by Dr. Arthur G. Stimson, Assistant Director of the Hygienic Laboratory, Washington, and has been carefully tested as to its reproducibility and its constancy. Comparative tests have been made also with the present standard loop. A strong solution of methylene blue in standard broth was substituted for the bacterial culture, "inoculations" being made into small tubes containing 7 cc. of distilled water. The resulting colors were read against a set of standards. In this way the amount of solution removed by each inoculation was readily determined. Ten loops were prepared and tested, the mean volume taken up by each one being determined by the average of ten "inoculations." The variation among these ten averages is taken as a measure of the reproducibility of the loop, *i. e.*, the agreement between the average performance of various loops. Six standard platinum loops were compared in the same way.

The volumes (average of ten readings each) actually taken up by the ten new loops were, in arbitrary units, 4.90; 4.94; 4.95; 4.98; 4.99; 5.01; 5.06; 5.08; 5.28; average 5.03, mean deviation .077 or 1.53 per cent. It is apparent that most of this error is due to one loop, omitting which, the results of nine tests would be, average 5.0, mean deviation .05 or 1.0 per cent. For the six standard platinum loops the volumes taken up were (average of ten trials each) in the same arbitrary units, 3.83; 3.89; 4.12; 4.15; 4.26; 4.46; average 4.12, mean deviation 0.17 or 4.10 per cent.

The mean error of the individual dip as compared with the average of ten dips with the same loop, measures the constancy of the loop. For the one hundred trials made with the ten new loops this mean deviation was found to be 2.52 per cent and for sixty trials with the six standard loops, 9.28 per cent.

The two kinds of error may be combined to give a general measure of error of each type of loop by counting the mean deviation of all the readings of all the loops of each type from their general average. This procedure gives for the ten new loops, average volume of one hundred trials, 5.03; mean deviation 0.136 or 2.71 per cent, and for the six standard loops, average volume 4.12; mean deviation 0.413 or 10.0 per cent.

The new loop is approximately equal to the present standard loop in volume, the average volume of the ten new loops being 5.03 arbitrary units and the corresponding volume of the standard loop, 4.12.

A modified system of dilutions is recommended which is both simpler and more consistent than the older one. In the selection of a proper range of dilutions attention must be given to the accuracy required and possible. As the coefficient is a ratio the accuracy is also relative, that is, a certain percentage of the final results. An ideal dilution schedule would, therefore, proceed as a geometrical progression, each successive dilution being a constant multiple of the preceding one. The practical difficulties of such a scheme are greater than its advantages would justify so that the expedient has been adopted of dividing the whole range into groups, the mean terms of each group being in geometrical progression, and the members of each group in arithmetical series, that is advancing by equal increments. This increment is 10 per cent of the number occupying the position of geometrical mean of each group, and 7 per cent. and 12.5 per cent respectively, of the end numbers of the group. This arrangement simplifies the making of dilutions since the whole spacing of the system is uniform, each group being similarly related to its basic dilution.

SECTION B. STANDARD PROCEDURE.

The following systematic procedure, taken in part from the progress report of the Committee for 1911, is set forth especially as an aid to beginners, and to illustrate the fact that certain details are subject to considerable variation without affecting the important features which make for uniformity of results.

Apparatus.

Sub-culture Tubes. A test tube rack of eight rows of ten holes each may be used for the sub-cultures. If the test be of twenty dilutions, eighty tubes are numbered serially and placed in the rack, which is placed conveniently at the worker's left hand.

Bunsen Burner. A bunsen burner, with a fan-tail top is led from the left and back of the bench with a little spare tubing.

Loop-rack. This is made of four pieces of half-inch wood, each 4 inches by 9 inches, joined in a frame so that the top is about 10 inches high. The top is provided with about six grooves for the loops. The latter are placed in their grooves and the rack is placed in front of the worker's right shoulder, close to the front of the bench, and almost at right angles to the front edge, but with a slight slant to the right and rear. The loops point to the left and the fan-tail burner is so adjusted as to properly envelop the loop which is

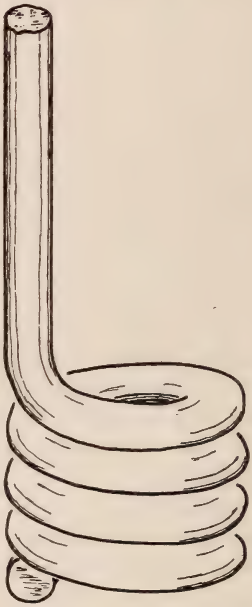

Fig. 1—New Standard Loop.

Four turns of Nichrome Wire, No. 23, B. & S., about a core, 0.072 inch in diameter (No. 13, B. & S.)

over it. The loops are used in succession and after each one is returned to its place, the burner is moved under it, thus providing at all times for a sterile and cool loop.

Loops. The loops used for transferring the culture after exposure to the disinfectant are made as follows:

A close cylindrical spiral is made by winding Nichrome wire, No. 23 B. & S.,* as tightly as possible about a piece of steel or other hard wire having a diameter of .072 inch (No. 13 B. & S. gauge). Wind about five full turns, bend the remainder of the wire sharply at a right angle to the wound portion, and parallel to the axis of the cylinder. Remove from the core and cut off the lower end to leave exactly four complete turns. When completed the successive turns of the spiral must touch one another continuously. See Fig. 1.

Seeding Tubes. The character of the seeding tubes to be used depends entirely upon local conditions. In places in which there is any doubt as to air contamination cotton-plugged tubes are much to be preferred. However under conditions such as exist in most laboratories the open seeding tubes, recommended in the present standard methods, are most convenient and quite satisfactory.

Seeding Tube Holder. Cut down an oblong wire test-tube basket to about 2½ inches in depth, and to the top fit a piece of half-inch wood, through which three rows of seven holes each have been bored, the holes being of proper size to accommodate the tubes loosely. An ordinary tripod is used to support this rack in the water bath. The legs of the tripod are cut so that the tops of the seeding tubes are a little above the surface of the water.

Inoculator. The inoculations of the diluted disinfectant with the culture are made with an apparatus described by Rosenau.* A capillary pipette, graduated in tenths cc. is fitted with a rubber bulb, and clamped to a ring-stand. The bulb is actuated by a second spring clamp the jaws of which engage it. This apparatus is placed at the right of the worker, so that he can push the loop rack away from him and draw the inoculator toward him and when through inoculating, reverse the action.

Water Bath. The water bath consists of a wooden box about 18 inches square and deep, containing a three or four gallon pail, packed around with sawdust which is lightly oiled so as not to become dusty. The bath is raised from the floor about six inches by cleats and castors, and when not in use is rolled under the bench. During the test it is on the floor at the right of the worker.

Time-piece. A watch or small clock of fair accuracy, provided with a second hand, is so mounted as to be conveniently and comfortably read by the worker from his place at the bench.

Culture Media.

The culture media are prepared as follows:

Broth. 10 grams of peptone (Witte's); 3 grams of extract of meat (Liebig's); 5 grams of sodium chloride, C.P.; Distilled water, 1,000 cc.

Boil for 15 minutes, make up to weight, filter, tube, sterilize at 10 pounds pressure for 20 minutes. No adjustment of the acidity whatever should be attempted. Determine and record the P_H value. This should be between 6 and 7.

Agar. To 1,000 cc. of the standard broth add 15 gms. of best grade agar, boil 30 minutes, make up to weight, filter, and sterilize at 10 pounds for 20 minutes. Do not use egg albumen to clarify.

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* Manufactured by Driver Harris & Co., Harrison, N. J.

* Hyg. Lab. Bull. 21, p. 60.

ORGANISM.

For the standard test organism in determining the coefficient against the typhoid organism a 24 hour old broth culture of B. typhosus (Hopkins) is used. Before beginning a test the culture is carried over in broth at 37° every 24 hours for at least five successive days, and the last culture well shaken, and filtered through sterile filter paper.

For carrying over the culture one standard loopful is used. It is important that the transfers be made as nearly as possible exactly on the 24 hour interval, although a variation of not more than 2 hours is allowable.

The stock culture of B. typhosus (Hopkins) is kept on agar slants. These cultures are incubated at 37° C. for 24 hours and then placed in the refrigerator until ready for use. In no case, however, should they be kept more than one month.

PHENOL.

While pure phenol crystals are undoubtedly the best standard which we have at present, they are far from being entirely satisfactory. Commercial phenol crystals are often contaminated with cresols and other phenol homologues. It is important that nothing but the highest grade of pure white synthetic phenol crystals be used,* of a solidifying point not less than 40° C. as determined by the method of Weiss and Downs.†

Phenol crystals themselves, as well as solutions change in germicidal strength upon standing, particularly when exposed to direct sunlight and to high temperature. Phenol changes more readily when melted, or in the presence of moisture, than when in the crystalline form. It is important, therefore, that the crystals of phenol be kept in a tightly stoppered bottle, in a cool, dry place and exposed to the light and moisture as little as possible. Phenol which has been exposed to the air and allowed to absorb enough water to alter its melting point or which has become at all red should be discarded for the purposes of this test. The 5 per cent stock solution is prepared as follows:

Melt the phenol in the original container and pour out approximately 50 grams into a closed weighing bottle; weigh and dissolve in the proper amount of water to give a 5 per cent solution. Do not attempt any further standardization. This stock solution is kept in the refrigerator in amber colored bottles of not more than 500 cc. capacity, and for a period not longer than three months.

DILUTIONS.

Distilled water. Sterile distilled water is recommended for all dilutions. Attention is directed to the danger of metallic copper in distilled water prepared with the common type of laboratory still in which the condensing surface is of tin-plated copper or brass. If the tin-plate is worn away, sufficient copper may be dissolved to materially influence the coefficient.

Five Per Cent Stock Dilution. Accurately graduated capacity pipettes are to be used in preparing the stock dilution of disinfectant. Five cc. of disinfectant are measured into a flask containing 95 cc. of sterile, distilled water, the interior of the pipette being rinsed several times with the contents of the flask. From this solution or emulsion and from the stock 5 per cent phenol solution the required dilutions are prepared.

Initial Dilution from Five Per Cent Dilution. Take 50 cc. of the 5 per cent stock dilution, place in a 100 cc. graduated flask and make up to the mark with sterile distilled water. Mix by pouring.

This gives a dilution of 1:40. With 50

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* The Barrett Manufacturing Company can furnish such a product.

† Jour. of Industrial Chemistry, Vol. 9, No. 6, page 569.

Initial dilution + water (cc.)	Initial dilution					
	1:20	1:40	1:80	1:160	1:320	1:640
	Final dilution					
4+4........	1:40	1:80	1:160	1:320	1:640	1:1280
4+5........	1:45	1:90	1:180	1:360	1:720	1:1440
4+6........	1:50	1:100	1:200	1:400	1:800	1:1600
4+7........	1:55	1:110	1:220	1:440	1:880	1:1760
4+8........	1:60	1:120	1:240	1:480	1:960	1:1920
4+9........	1:65	1:130	1:260	1:520	1:1040	1:2080
4+10.......	1:70	1:140	1:280	1:560	1:1120	1:2240

cc. of this dilution repeat the process to obtain a dilution of 1:80 and so on by successive dilutions until the following initial dilutions, or such of these as are necessary for the test, are prepared:

1:20 1:160
1:40 1:320
1:80 1:640

Final Dilutions from Initial Dilutions. With sterile delivery pipettes measure the quantities of initial dilutions and sterile distilled water, required, in accordance with the following table, to obtain the desired final dilutions.

TEMPERATURE.

The standard temperature at which the organism is exposed to the action of the disinfectant is 20° C. but a variation of not more than 0.5° on either side of this figure is allowable. This temperature should be maintained by the use of a water bath, the design of which may be left to the individual operator. It is important, however, that the bath be so arranged that the water will rise to a height greater than that of the dilution of disinfectant contained in the seeding tubes. The cultures and dilutions of disinfectant should be brought to a temperature of 20° C. before starting a test. In very warm weather it will be found that there is a material increase in the temperature of the water bath during the 20 minute period. If, however, the bath is brought at the start to a temperature of 19.5° it will not generally exceed 20.5° during the test. For the determination of the temperature coefficient a temperature of 30° is also employed.

All sub-cultures are incubated at 37° for 48 hours. The temperature of the incubator should be maintained between 36° and 38°.

TECHNIQUE.

The various dilutions are prepared as already described.

In the test of a new preparation the coefficient of which is unknown it will be necessary to make a set of range-finding tests. For this purpose use the series 1:40, 1:80, etc., at the head of the columns in the Table of Final Dilutions and select for the actual test with phenol a series of final dilutions ranging from the highest dilution which killed in 5 minutes, to the lowest dilution which failed to kill in 20 minutes. If some approximate idea of the coefficient is available, or if the preliminary test indicates a too extensive range of dilutions for the final test, a closer range may be obtained by restricting the test to fewer columns and using the middle row of dilutions together with the top row.

The seeding tubes having been properly

sterilized are brought to the bench and placed in the seeding tube rack to the number required. Five cc. of each of the dilutions of phenol and of the disinfectant to be tested are placed in order in these seeding tubes, which are appropriately numbered, a separate 5 cc. delivery pipette being used for each dilution. The tube containing the filtered culture is next placed in one of the holes of the seeding tube holder which is then placed in the water bath and allowed to stand there for a sufficient time to bring the contents to temperature. The inoculator is then filled with culture and, at the beginning of an even five-minute period, the first seeding tube is inoculated with 0.1 cc. of culture, and the succeeding tubes are then inoculated at appropriate intervals.

If the manipulator is sufficiently skilled to make inoculations and transfers at 15 second intervals, as at present recommended in the standard procedure, the total number of dilutions including the phenol dilutions, that can be carried through a test simultaneously is 20. Five of these are necessary for the phenol, 1:80 to 1:120 inclusive, leaving a maximum of 15 for the disinfectant. This will permit the employment of two of the columns of the table of final dilutions if necessary. In practice, however, it will seldom be found necessary to extend the range over more than one complete column or eight dilutions which with five phenol dilutions, gives thirteen in all. This will permit the making of inoculations and transfers at 20 second intervals, with one minute leeway at the end of each round, a safer and more comfortable schedule. For the beginner, 30 second intervals are recommended, which permit the carrying of ten dilutions simultaneously. Whatever the interval decided upon, it is quite desirable that a plan of the test showing the dilutions to be used, intervals between inoculations, and times of making subcultures be carefully laid out on paper so that there shall be no confusion in these matters during the actual test. The following will serve to illustrate the value of such a paper plan.

A set of these plans, covering the more common range of working conditions, might well be prepared in standard form for ready reference.

When the tubes have all been inoculated, the inoculator is pushed away diagonally and the loop-holder is drawn up to the edge of the bench and just before the expiration of the time interval, sub-culture

PLAN FOR TEN DILUTIONS AT THIRTY SECOND INTERVALS.

	Seeding Tube No.	Dilution	Inoculate		5-min. test		10-min. test		15-min. test		20-min. test	
			Min.	Sec.	Min.	Sec.	Min.	Sec.	Min.	Sec.	Min.	Sec.
Phenol.	1	1:80	00	00	5	00	10	00	15	00	20	00
	2	1:90	00	30	5	30	10	30	15	30	20	30
	3	1:100	1	00	6	00	11	00	16	00	21	00
	4	1:110	1	30	6	30	11	30	16	30	21	30
	5	1:120	2	00	7	00	12	00	17	00	22	00
Test...	6	1:360	2	30	7	30	12	30	17	30	22	30
	7	1:400	3	00	8	00	13	00	18	00	23	00
	8	1:440	3	30	8	30	13	30	18	30	23	30
	9	1:480	4	00	9	00	14	00	19	00	24	00
	10	1:520	4	30	9	30	14	30	19	30	24	30

tube no. 1 is taken in the hand, the plug withdrawn, and a loop dipped perpendicularly into the first seeding tube. At the expiration of the time interval, the loop is withdrawn, and the transfer consummated. The loop is returned to its groove in the loop-holder, the burner moved in place under it and the sub-culture tube given a rapid whirling movement to mix its contents and replaced. Another tube and another loop are then taken in hand for the next transfer.

At the completion of the test, the sub-culture tubes are placed in the incubator, and 48 hours later they are removed, read and recorded.

THE A. P. H. A. STANDARD PHENOL COEFFICIENT.

The concentrations of the highest dilutions of the disinfectant which gave negative results in 5, 10, 15, and 20 minutes respectively, are divided by the corresponding concentrations of phenol to obtain a series of four coefficients. The arithmetical mean of the four is taken as the "Mean Phenol Coefficient against Typhoid, 20° C., 5–20 minutes, A. P. H. A." It is recommended that a final report should be based upon the results of not less than three separate tests. This coefficient will be known for brevity as the "A. P. H. A. Standard Phenol Coefficient," but for any other organism, temperature or time ranges that may be employed the word "Standard" will be omitted and the full expression given. The determination of these special coefficients for special uses is recommended.

Units Employed. It should be observed that the customary procedure of weighing the phenol and measuring the disinfectant by volume, gives a coefficient which is actually expressed in two sets of units. Strictly interpreted, this coefficient gives the relation (under the conditions of the test) between one liter of the disinfectant and one kilo of phenol, or between a gallon of disinfectant and 8.34 pounds of phenol. Comparison upon a weight basis may be obtained by dividing the coefficient by the specific gravity of the disinfectant, or by making the initial 5 per cent stock solution by weight. This latter procedure is necessary in testing a solid substance and if in any case it is resorted to, the results should be expressed as "A. P. H. A. Standard Phenol Coefficient (by weight)." This procedure also permits the study of the disinfectant powers of water soluble gases and the reporting of the results by weight.

Stability of Emulsions. The great majority of commercial disinfectants are prepared by emulsifying coal tar distillates, and it is important that these products should form uniform and stable emulsions when diluted with water. It occasionally happens that poorly manufactured products of this type form perfectly stable emulsions in the range of dilutions used in determining the coefficient, while in a more concentrated solution the greater part of the germicidal power is lost, owing to the breaking down of the emulsion and separation of the active constituents. It is recommended therefore that, when testing this type of preparation, 100 cc. of a dilution of the same strength as that to be used in actual disinfection be allowed to stand in a tall cylinder at room temperature, for 24 hours. There should be no appreciable separation of oily material at either top or bottom.

Occasionally products are found which do not form stable emulsions in the range of dilutions used in determining the coefficient. If the separation is rapid the results of the test may be very irregular, so that it is practically impossible to determine the coefficient. Such a possibility should always be considered in looking for the explanation of irregular results.

The phenol coefficient determined under carefully standardized conditions is believed to be a reliable means for ascertaining the relative values of that class of disinfectants prepared by emulsifying coal tar distillates. It is also believed to be suitable for the routine control of manufacturing processes and should be employed for this purpose by all manufacturers. With disinfectants of varying chemical or physical nature the simple coefficient may be misleading. This phase of the problem is discussed in detail in Section C. and some additional determinations are recommended, which should prove of value in showing how disinfectants of different types vary under varying conditions of practice.

SECTION C. THEORETICAL CONSIDERATIONS.

Principles of Disinfectant Testing.

In order to make the results of the test somewhat more directly applicable to different types of disinfectants under the varying conditions of practice, and in order further to emphasize the limitations that restrict the use of the phenol coefficient and to remove these limitations as far as possible, the scope of the test has been somewhat extended and certain new biological constants have been made available thereby. The significance of these limitations and of the new data that will be made available by the proposed changes will therefore be discussed in some detail.*

The germicidal power of any disinfectant, as it is usually measured in terms of time to sterilize, is affected by such factors as the specific resistance of the organism, the medium on which the disinfection is carried out, the number of organisms present in unit volume, the concentration of the disinfectant, and the temperature at which the test is made. It is apparent, therefore, that a statement of the properties of a disinfectant must, if it is to be of practical service, describe the effect of each of these variables upon the germicidal power or efficiency. A realization of the difficulty of such a complete study and record of the large number of existing disinfectants and of the utter inadequacy of existing data upon even the simpler disinfectants and the more common pathogenic organisms, led Rideal and Walker (2) to the conception of a coefficient which would measure not the absolute effect of the disinfectant, but its relative effect as compared with some standard substance.

Phenol was chosen for the standard and the relation between the dilution of the disinfectant in question and that of phenol capable of exerting an equal germicidal effect was called the carbolic acid coefficient.

It is evident that if phenol and the disinfectant under examination be equally affected by variations in the numerous controlling factors outlined above, then their relative germicidal values, and consequently the coefficient, will remain unaffected or constant. This would be the case, for example, if an increase in temperature resulted in each case in an equal proportionate increase in the rate of killing, if doubling the concentration increased the rate to the same relative extent in each case, and if the resistances of various strains of organisms, the varying composition of the medium in which the organism is grown or the test made, and the numerous other variable factors, produced the same relative effect upon the germicidal efficiency of the two disinfectants. If all these suppositions were true, then there would be a single phenol coefficient for each disinfectant and the conditions under which the test is made would be immaterial. The early history of the test indicates that this was believed to be the case, and the phenol coefficient is even now almost universally accepted as a measure of the strength of any type of disinfectant against any pathogenic organism and under all conditions of practical application. This is particularly shown in the use of the coefficient in specifications, in labeling and advertisements, and in the determination of relative price values.

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* For more complete discussion see Phelps, Jour. Inf. Dis. 8, 1911, 27 and Phelps, Amer. Jour. Pub. Health 3, 1913, 53.

On the other hand, those familiar with the details of the test are fully aware that there are many possible "phenol coefficients" depending upon the conditions of testing, that particular coefficient which is obtained by testing under the standard conditions, being but one of this number.

It measures, therefore, the value of the disinfectant in question under those particular standard conditions and relative to phenol, and other conditions would furnish other measures of relative value.

Fortunately for the cause of disinfectant testing it seems to be the case that this variation in phenol coefficient is due to the difference in chemical and physical natures of the two disinfectants and that the less these differences between any two disinfectants the more nearly constant will be the relation of their respective efficiencies under variable conditions of testing. Chick* had shown for example that the phenol coefficient of mercuric chloride at 2.5 minutes is 13.6 and at 30 minutes, 550, while on the other hand evidence is accumulating which tends to show that in that group of commercial products made by emulsifying coal tar distillates, the variability is reduced to a minimum.

These products, being unlike a phenol solution, have variable coefficients with varying time and and concentration, but among themselves, the variation is similar so that their phenol coefficients determined under well standardized procedure, giving their true values relative to phenol under one set of conditions, serve to grade them among themselves under all other physical conditions. In this case the phenol coefficients of emulsified coal tar disinfectants do measure the relative value of those products that are somewhat similar in chemical or physical properties, and the greater the dissimilarity among such products or between them and other types of disinfectants, the less reliable is the coefficient as a measure of relative valuation.

It is apparent, therefore, that if disinfectants of different types are to be rated and compared by any single coefficient, the effects upon the coefficient of the more important variables, at least, must be taken into consideration. Just as the complete statement of the electrical conductivity of a metal includes its conductivity at one stated temperature together with the thermal coefficient or effect of varying temperature upon the conductivity, so a complete statement of the phenol coefficient must include the coefficient under fixed conditions and a measure of the effect of varying conditions.

In so far as this effect of variable conditions is in itself constant, as determined by the constancy of certain additional factors to be described, just so far is it permissible to compare the disinfectants under consideration upon the basis of their phenol coefficients. In other cases, and particularly among disinfectants of varying types, a full comparison of properties must involve a further statement of the effect of variable conditions upon the efficiency of the disinfectants tested.

In view of the somewhat general use of the phenol coefficient as a standard basis of reference it would seem desirable to continue this standardized specific measure as a point of departure, with a more complete statement of its limitations than has hitherto been made. It is also highly desirable to extend the practical usefulness of this measure by removing from it certain of the experimental restrictions that have hitherto been imposed, thereby broadening its scope and significance.

The most important restriction is the

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* Jour. of Hyg. 1908, 92.

organism used in the test. The trend of the time is strongly towards specific and away from general disinfectants. No further recommendations are made in this connection, however, than to point out the possibility that the coefficient as determined with one organism may have no significance in connection with another and the urgent desirability of extensive studies of various types of disinfectant upon various pathogenic organism. In such a study the general procedure recommended for the typhoid organism should be followed, with such modification as to media and other details as may be found necessary.

The second important variable to be considered is that of concentration. The efficiency of a disinfectant, measured in terms of rate of killing, or time to sterilize a given volume, containing a given initial number, is not proportional to its concentration, but to some power of that concentration depending upon the nature of the disinfectant in question. With phenol the rate of killing varies approximately as the sixth power of the concentration. If, with the disinfectant under study, it varies as the fourth power, and if the concentrations necessary to kill in 2.5 minutes are found to be 1: 80 and 1: 400 respectively, then those necessary to kill in 15 minutes (one sixth the rate of killing) would be respectively, 1: 108 and 1: 626, giving coefficients for the two time periods of 5.0 and 5.8. Under the procedure adopted by Rideal & Walker a single time period was adopted. The Lancet method gave some recognition to this variable feature by averaging the two coefficients obtained at 2.5 and 30 minutes and the Hygienic Laboratory method takes similarly the 2.5 and 15 minutes results. In view of the significance of this coefficient variation with the time of exposure it is believed that it should be measured and reported rather than concealed in an average.

To this end it is recommended that separate coefficients be determined at 5, 10, 15 and 20 minutes; the mean of these values being taken as the "mean A. P. H. A., phenol coefficient 20° C., 5–20 minutes," or, for brevity, the "A. P. H. A. standard phenol coefficient"; and that the ratios between the 5 and 10 minutes, and the 10 and 20 minutes values be computed, averaged and reported as the "time ratio."

The time ratio as thus determined bears the following relation to the concentration exponent, R being the ratio of the coefficient determined for any time of exposure, to the coefficient for twice that time of exposure, and n, the concentration exponent, which shows by what power of its concentration the efficiency of a disinfectant varies:

$$\log R = 0.05 - \frac{0.3}{n}.$$

For more ready interpretation of the significance of the time ratio, the following table shows for each value of the ratio R,

Relation between the "Time Ratio," R, the Concentration Exponent n, and the Increase in Germicidal Power of a Disinfectant Resulting from a Doubling of Its Concentration in the Mixture:

Time ratio R	Concentration exponent n	Relative germicidal power of a mixture of double concentration, 2^n
.1	.29	1.2
.2	.40	1.3
.3	.52	1.4
.4	.67	1.6
.5	.85	1.8
.55	.97	2.0
.6	1.10	2.2
.65	1.27	2.4
.7	1.46	2.8
.75	1.72	3.3
.8	2.04	4.1
.85	2.49	5.6
.9	3.13	8.8
.92	3.48	11.1
.94	3.90	15.0
.96	4.43	22.0
.98	5.10	34.0
1.00	6.00	64.0
1.01	6.57	95.0
1.02	7.25	152.0
1.03	8.07	267.0
1.04	9.09	544.0

the corresponding value of n, and the relative increase in the germicidal power of the disinfectant corresponding to a doubling of its concentration. These last named values are given by the expression 2^n, the germicidal value varying as the nth power of the concentration.

The significance of the concentration exponent has to do with the use of a disinfectant in various concentrations. A disinfectant with a high exponent, like phenol, will have its germicidal power increased at a rapid rate with increasing concentration and decreased equally rapidly with increasingly dilution. Such a disinfectant will be said to possess low antiseptic powers for on dilution the germicidal power is rapidly "diluted out." One with a low exponent will increase more slowly in germicidal power with increasing concentration and decrease more slowly with increasing dilution. It would be classed as a good antiseptic. Phenol with an exponent of six is of the first type and mercuric chloride, exponent one, of the second.

A third important variable, carefully controlled in the test of a disinfectant, is the temperature. In order to obtain consistent phenol coefficients it has been found necessary to adopt a standard temperature of testing. The recommended procedure specifies a temperature of 20° C. It is obvious, however, that practical working conditions will not always conform to this standard and, the phenol coefficient being actually dependent upon the temperature selected for the test, cannot measure the true relative value of the disinfectant at other temperatures. It is known that many disinfecting reactions, like chemical reactions in general, have a definite temperature coefficient which measures the proportionate increase in the rate of the reaction (or decrease in time of completion) for a stated increase in temperature. It is important to note the form of this relation. The increase in rate is proportionate, as the temperature increases by equal increments. The physico-chemical law is thus expressed:—

As the temperature increases in arithmetical progression the velocity of reaction increases in geometrical progression. Thus, if a rise of 10° doubles the rate, a further rise of 10° will double it again so that an increase of 20° will quadruple it. The temperature coefficient, usually expressed for a 10° interval, gives the ratio of the rate of reaction at the higher temperature to that at the lower. In the case of disinfection the respective times to complete the reaction may be taken inversely as the rates so that the temperature coefficient for a 10° interval will be the ratio of the longer to the shorter time.

Little exact knowledge is available as to the temperature coefficients of disinfectants but their importance in practical disinfection is such as to justify careful study and record in the case of any disinfectant worthy of serious consideration. By the simple expedient of determining the relative times of sterilization at two different temperatures under otherwise comparable conditions, the temperature coefficient is readily determined. As between two disinfectants, the one with the higher temperature coefficient will show the greater rate of increase in efficiency at higher temperature, and of decrease at lower. A comparison of the temperature coefficients will therefore disclose those disinfectants particularly suited for use at low temperatures or at unusually high temperatures. For use at temperatures above the standard employed in testing, a high temperature coefficient is desirable and vice versa.

It might appear that the examination of a disinfectant is becoming an increasingly serious matter, but it is believed that any simpler formula than that outlined not only fails to describe the disinfectant, but, if applied to preparations of different types may be actually misleading and capable of doing harm. A disinfectant which has been studied and described in accordance with the principles outlined above, may be said to have had its bacteriological constants fairly well determined. To this end the following determinations are recommended in addition to the standard phenol coefficient:

(a) The determination of the coefficient against disease producing types of bacteria other than B. Typhosus particularly the ones against which the disinfectant is to be used.

(b) The temperature coefficient; and

(c) The concentration exponent or "time ratio."

From a theoretical point of view the phenol coefficient is eminently unsuited as a starting point for the determination of these new constants. In view, however, of its general adoption and legal recognition and of the much greater difficulties of technique involved in a more accurate and fundamental determination of the reaction constants of a disinfectant, the recommendations for the determination of the concentration exponent and temperature coefficient are based upon the recognized procedure.

DETERMINATION OF THE TEMPERATURE COEFFICIENT.

That concentration of the disinfectant which killed in 20 minutes and was, therefore, employed in computing the phenol coefficient at the 20 minute period is again taken for the temperature coefficient test. Four identical mixtures of disinfectant and culture are prepared exactly as in the previous case except that two of these are contained in a special temperature bath at 30° C. The successive mixtures are made at 30 second intervals, the two 20° tubes being prepared first. At one minute intervals from the time of mixture a subculture is made from each of the two 30° tubes, this procedure being continued up to the eighth set and then continued upon the 20° tubes from the tenth to the twenty-second minute. Incubate, read and record the results as previously. Take the average time to kill at 20° C. from two tests at that temperature and similarly for 30°.

The Temperature Coefficient for Ten Degrees. Divide the least time required for sterilization at 20° (average of two tests), by the similar time at 30°, other conditions being the same. The quotient is the temperature coefficient for 10°. The coefficient for 5° is the square root of the 10° value, and that for one degree the tenth root. The 10° coefficient is usually employed in chemical literature and may be computed from the value for any other temperature range such as x degrees by taking the $\frac{10}{x}$ power of that value.

The Time Ratio and Concentration Exponent. These are related constants and only one of them need be reported. The time ratio is the ratio between the coefficient determined at any time period and the similar coefficient determined at twice that time period. Under the standard procedure divide the 5 minute by the 10 minute coefficient and the 10 minute by the 20 minute coefficient. Average these two quotients and report as the time ratio; compute the concentration exponent by formula or read it from the Table, page 518.

A complete study of a disinfectant must also include its physical and chemical behavior in the medium in which it is to be employed, as for example, its diffusibility or powers of penetration, and especially its chemical permanence. These are matters demanding careful investigation but as they vary from case to case it would be hopeless to attempt to include them in a general specification of the disinfectant. There is urgently needed, however, a comprehensive study of these practical phases of disinfection. Beyond such obvious chemical facts as the failure of acid as a disinfectant in an alkaline medium, of an oxidizing disinfectant in a reducing medium, or of a heavy metal disinfectant in a precipitating medium, but little is known of the chemical behavior of disinfectants in the media commonly encountered. The surprising effects of common salt upon a solution of phenol and of ammonia upon hypochlorite are but indications of the importance of this whole subject.

Constants to be Reported.

It is believed that a single phenol coefficient is a sufficient basis for a preliminary classification of disinfectants and for the exclusion of worthless trade preparations and that furthermore it forms a reliable basis for the relative valuation of disinfectants of similar chemical and physical nature, particularly the emulsified coal tar preparations. To this end a reputable trade product should always be accompanied by a statement of its coefficient preferably in terms of the "A. P. H. A. standard Phenol Coefficient." This single value, however, gives inadequate indication of the usefulness of all types of disinfectants under other than laboratory test conditions and should be regarded more as a presumption than as direct evidence of quality. The time factor or the concentration exponent furnishes much more detailed information of the action of the disinfectant upon typhoid organisms at various concentrations and ought always to be determined. The temperature coefficient ought also to be carefully studied by an investigator proposing to undertake disinfection under temperature conditions unlike those of the test.

These three tests against typhoid should be considered in preparing specifications, and manufacturers and dealers should be prepared to specify values for the guidance of health authorities and others.

Finally disinfectants intended for special purposes should be standardized against the particular organism in question and the report should so indicate. As far as practicable also the test should be under standardized conditions simulating those of practice and the report should so indicate. In particular, attention must be given to the general chemical nature and reaction of the disinfectant and to incompatible mixtures and interfering chemical reactions.

There remains to be determined and made available a large amount of definite and practical information concerning the action of disinfectants of various types upon various important pathogenic organisms so that the general relationships existing between the relative resistances to each general type of disinfectant shall be available. To this end the most thoroughgoing and complete tests and application must be made by public health research laboratories. Such studies are necessary for the construction and understanding of a proper theory of disinfection.

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A FILING SYSTEM FOR PUBLIC HEALTH LITERATURE.*

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THE following decimal system has been used by the authors in filing pamphlets and other material bearing upon professional subjects with very satisfactory results. It is a brief or skeletal system capable of indefinite expansion or modification for individual needs and is presented here as suggestive rather than perfect.

An alphabetical cross index has been found helpful. It has also seemed expedient to depart from close adherence to the decimal system by listing specific diseases in alphabetical order under the heading "Communicable Diseases."

An inexpensive filing case may be secured by those for whom expense is a consideration in purchasing storage cases of letter size with pasteboard tabs and folders. Books may be arranged in the library according to this general plan. The index of articles in journals which are kept intact and on file is best accomplished by an alphabetical card index on 3 x 5 cards. If preferred, such a slip can be placed in a proper folder of the filing cabinet.

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DIET AND THE HEALTH OF THE WORKER.

The pressure of high prices unites with the awakening of the individual conscience to promote the conservation of food. Under the circumstances we must ask whether widespread malnutrition is a definite danger. Conservation of health and endurance is an ideal which, we hope, need not be sacrificed in the endeavor to save provisions for export. The problem has two aspects, *reduction* and *substitution.*

To cut down the supply of a population without changing the kinds of food in the allowance is to produce two results: people become smaller and a limit is set to their activity. Loss of weight might be salutary for perhaps one-fourth of our fellow-citizens; it would often be undesirable. Restriction in working capacity is not to be thought of. One would be reluctant to urge the cutting down of exercise. It may be noted, however, that protection from exposure to cold and ample hours of sleep appreciably lower the quantity of the required ration. On the whole we must conclude that any marked reduction in food consumption would have an unfortunate effect.

But if we cannot materially scale down our daily portion we can practise substitution to an extent seldom conceived. We can go far in this direction without inviting deficiency diseases. Lusk reassures us by calling attention to the health and power of the Italian peasantry, sustained for generations upon corn-meal, beans, olive-oil, and greens. We have recent evidence that almost any imaginable diet is redeemed and made safe by the liberal addition of milk. This food is so marvelously adapted to the purposes of nutrition that one may say that it is, like faith, "the substance of things hoped for, the evidence of things not seen."

The chief hardship imposed by an unwonted diet is loss of pleasure in eating. This is not an unimportant matter since digestion often waits on appetite. Good cooking is more than ever essential. But especially we need optimism founded in our own resolution and fostered by a variety of recreative interests to keep us sane and steady in this long-drawn trial.

P. G. S.

THIRTEEN THOUSAND LESS CASES OF VENEREAL DISEASE.

Surgeon-General W. C. Gorgas of the United States Army has recently said that in the last six months there had occurred at least 13,000 less cases of venereal disease among the males of military age than there would have been had these men not entered the Army. This means that the ancient bug-a-boo that venereal disease is far more rampant in the military than in the civil population can no longer stand. It means that the control of venereal disease in the Army by the Army is effective. It means, too, that the establishment of those special allied bureaux of the War Department, namely, the Division of Social Hygiene, directed by Major William F. Snow, and the Commission on Training Camp Activities, directed by Mr. Raymond Fosdick, is well warranted, and that these initially experimental, though strongly conceived Bureaux of the War Department have been mightily successful in causing such conditions to obtain that 13,000 of our men, who would otherwise have contracted venereal infection, are now "fit to fight."

This minimal estimated decrease is attributed to four main agencies as applied by the War Department: early treatment (prophylaxis); educational and recreational propaganda, both by pamphlet and lecture, not only among soldiers, but in the civil population among all classes; coöperation of the community and its civil, professional, and social organizations to keep the community morally clean, and hence assure the protection of the health of the soldier; and, lastly, through law enforcement, wherein the Army and Navy, through its representatives see that the laws prohibiting the sale of liquor to men in uniform, the laws of the licensing boards, the laws relating to disorderly conduct and commercialized vice, are strictly adhered to; wherein proper prosecution of offenders of such laws is enforced; wherein legislation which will assist the War Department aims is inaugurated and supported.

To carry out this vast program for the promotion of moral and physical sanitation there has been developed an energetic system, centralized at Washington, but largely directed in detail by section directors, both medical and legal, who being in constant contact with all phases of the problem, direct the efforts of the Department's representatives.

It is comparable to a vast nervous system, where the outward sensations are transmitted to the central nerve ganglia, and there occurs the inevitable reaction. A soldier contracts gonorrhœa, and the case is disclosed by the regimental surgeon. Treatment takes place—a court-martial if the soldier did not report for prophylaxis at one of the many stations (U. S. Dispensaries) in and outside of army camps. A social history record is taken at the infirmary or hospital, and the record forwarded to the proper authority. From this there is obtained the name and address of the girl who infected the soldier and the place where the association took place, and whether or not alcohol was used. If the place of association be a hotel or lodging house, pressure is brought to bear on the community officials—things happen; if alcohol was obtained, more things happen. Then the girl is located and—after persuasion or by other means she submits to examination. Treatment and often detention results; surely a lesson is taught. Thus is the machinery of the system set in motion.

But state and municipal laws are not as far advanced as the War Department's endeavors. Serious hampering results from the ancient false delicacy relating to the occurrence of venereal disease and its public suppression. State legislatures and public health councils, civil, professional, and social bodies must learn of the true condition of their communities and others; must know of the Army's efforts and object; must know and be powerful and sincere enough to apply the prevention.

The War Department learned well its lesson of the Mexican Border, of the experience of the allied and enemy armies on the continent where hundreds of thousands of troops are unfit because of this social poison. And in the full knowledge of this experience and learning, it has evolved this great movement to prevent infection. A. D. H.

STORIES FROM THE DAY'S WORK.

Few things are so stimulating to health officers as to exchange stories from the day's work. Public health administration means more than preventive medicine, bacteriology, sanitary engineering and research; it involves also a knowledge of human nature. Many a health officer who knew public health from A to Z found difficulty in his work because he was not able to deal with men. The experiences of others along these lines are very helpful to every sanitarian, and for this reason the Journal has a section entitled, "Stories from the Day's Work."

The *Bulletin* of the Louisiana State Health Department recently published a quotation running somewhat as follows: "If you have a dollar and I have a dollar, and we swap dollars, you and I still have a dollar each. But suppose that you have an idea and I have an idea, and we swap ideas. Now you and I each have two ideas."

Your contributions to this section are invited. The experiences may be about men or things, and should preferably range between 500 and 1,000 words in length.

SURGEON-GENERAL GORGAS REACHES THE RETIRING AGE.

The *Southern Medical Journal* reminds us that on October 3, 1918, Surgeon-General Gorgas will reach the retiring age, sixty-four years.

We are told that the Surgeon-General is in vigorous health. He is at his desk at the War Department at 8 or 8.30 in the morning, and he is one of the last to leave in the afternoon. He walks to and from his work, more than a mile every day, and in the Mills Building was in the habit of climbing up and down the seven flights of stairs several times a day, because he liked the exercise and did not want to wait for an elevator.

The high regard of the public health and medical professions for Surgeon-General Gorgas is well known. His achievements in cleaning up Panama and Havana, and, more recently, his efficient conversion of the Medical Department of the Army into a tremendous organisation have stamped him as a man whom history will remember. The endorsement of Gorgas for a Nobel Prize by the American Public Health Association last year was a well-deserved tribute.

We hope that it will be possible to give the Nation the continued services of Surgeon-General Gorgas, at least during the remainder of the War.

ASSOCIATION NEWS

By the Secretary, A. W. Hedrich.

Public Health Administration Section.—The time for the next annual meeting is rapidly approaching, and the executive committee asks for your hearty coöperation in making the program up to the usual standard of excellence for the section. Our aim must be not to secure speakers to occupy an allotted time, but to find time for all of the speakers who have vital messages to bring to the section. Time-worn subjects must be avoided unless the subject matter is absolutely new or is presented from an entirely new viewpoint. Every speaker must feel that his topic is so important that no member can fail to hear his address without regret.

We will plan for enough section meetings to give everyone an opportunity to place new discoveries, experiences or ideas before the members but we will not pad the program. We feel that if a message is important enough to interest our members the speaker will ask for a place on the program, and we now appeal to every member of the Association to bear this plan in mind and to communicate with the section secretary promptly in regard to any subject that in his opinion should appear on the program. This, above all the years, is the year for volunteer service in the dissemination of health knowledge. C. H. Wells, Secretary, Montclair, N. J.

⁂

ANNUAL MEETING PAPERS.

Those who wish to offer suggestions of subjects and speakers for the next annual meeting are requested to communicate with the program chairmen:

Laboratory Section—Dr. R. B. FitzRandolph, State Department of Health, Trenton, N. J.;

Public Health Administration Section—Mr. Chester H. Wells, Montclair, N. J.;

Vital Statistics Section—Mr. Richard C. Lappin, Bureau of the Census, Washington, D. C.;

Sanitary Engineering Section—Mr. A. E. Fisher, 30 Albernarle St., Rochester, N. Y.;

Sociological Section—Dr. Ira S. Wile, 230 West 97th St., New York City;

Industrial Hygiene Section—Dr. Francis D. Patterson, 506 Kunkel Bldg., Harrisburg, Pa.;

Food and Drugs Section—Dr. James O. Jordan, 1104 City Hall Annex, Boston, Mass.

⁂

Milk Report Supply Exhausted.—The 1916 report of the committee on Standard Methods for the Bacteriological Analysis of Milk is out of print. A new report is expected and if presented, will be published shortly after the annual meeting in October.

⁂

The following were elected to membership in the Association in June, 1918:

Equitable Life Assurance Society (Corporate Member), New York.

Effie L. Lobdell, M. D., Chicago, Ill.

Stewart G. Thompson, State Board of Health, Jacksonville, Fla., Statistician, Bureau of Vital Statistics.

Wm. H. Bryan, M. D., State Board of Health, Jacksonville, Fla.

Philip S. Doane, M. D., Philadelphia, Pa., Director Health and Sanitation, U. S. Shipping Board.

J. Dale Graham, Columbus, Kans., County Health Officer.

Eliza J. Dadmun, M. D., Boston, Mass.

John L. Newmann, Madison, Wis., Instructor, Medical Bacteriology, University of Wisconsin.

Ernest T. Manning, M. D., Omaha, Neb., Commissioner of Health.

C. W. Milliken, M. D., Barnstable, Mass., Health Officer.

J. W. Lauck, M. D., Olsburg, Kan., County Health Officer.

W. S. Prout, M. D., Concordia, Kans., County Health Officer.

C. B. Martin, M. D., Baltimore, Md., Medical Supertintendent Baltimore Dry Docks.

F. M. Coffman, M. D., Ford, Kan., County Health Officer.

Lieut. Chas. D. Shelton, Topeka, Kans.

J. J. Entz, M. D., Hillsboro, Kans., County Health Officer.

C. S. Kenney, M. D., Norton, Kans. Superintendent State Tuberculosis Sanitarium.

Ernest D. Williams, M. D., Kansas City, Kans.

C. W. McLaughlin, M. D., Kansas City, Kans. City Health Officer.

A. C. Gulick, M. D., Goodland, Kans., County Health Officer.

B. F. Jeffers, M. D., Francis, Kans., County Health Officer.

Helen C. Reilly, Quincy, Mass., Public Health Nurse.

Harry S. Wagner, M. D. Pressmen's Home, Tenn., Physician.

Frank Knause, M. D., Brooklyn, N. Y., Deputy Commissioner of Health, New York City.

Charles E. Gabel, Ph. D., Galveston, Tex. Instructor, Bacteriology, University of Texas.

Charles A. Neafie, M. D., Pontiac, Mich. Health Officer.

George E. MacArthur, M. D., Ipswich, Mass., Board of Health.

John T. Myers, Omaha, Neb., in charge of Bacteriology and Public Health, University of Nebraska.

Arthur G. Warr, Prince Albert, Sask., Sanitary Inspector.

Eli Grimes, M. D., Des Moines, Iowa.

Dutchess County Health Association, Poughkeepsie, N. Y.

⁂

Board of Directors Meets.—An important meeting of the board of directors was held at Chicago on June 13, 1918. The following directors were present: Dr. Hastings, Dr. Frankel, Dr. Evans, Dr. Peter H. Bryce, Dr. Guilford H. Sumner, Dr. J. N. Hurty, Dr. Hoyt E. Dearholt, Dr. John D. Robertson, Dr. Oscar W. Dowling, Dr. P. S. Schenk, Dr. B. L. Arms, Dr. Henry Boswell, Dr. W. C. Woodward, Dr. Donald B. Armstrong. and Mr. A. W. Hedrich.

The president first called upon Dr. Frankel for the report of the treasurer. Dr. Frankel in presenting his report called attention to the fact that for the first time in years the Association was entirely out of debt, and in fact had a balance on hand in bank of about $4,000.

The secretary, Mr. Hedrich, submitted a short report, supplementing the remarks of the treasurer.

Dr. Frankel and Dr. Hastings reported communications with the Rockefeller Foundation, and stated that indications were that the Rockefeller Foundation probably would not immediately grant the subsidy applied for by the American Public Health Association.

Medical Milk Commissions.—Dr. Otto P. Geier appeared before the committee with the suggestion that the American Association of Medical Milk Commissions be amalgamated with the American Public Health Association. Upon motion of Dr. Evans it was voted that the American Public Health Association appoint a committee to meet with the committee from the American Association of Medical Milk Commissions upon this subject. The president appointed Dr. William C. Woodward as convener of the committee with authority to add to the committee.

Corporate membership.—The subject of corporate membership was next considered in great detail. The secretary reported corporate memberships taken out by the following insurance companies: *

Metropolitan Life.
Prudential Insurance Co.
Mutual Life of New York.
Equitable Assurance Co.
Columbian National Life.
New England Mutual Life.
Travelers Insurance Co.
Union Central Life.
Canada Life.
Sun Life.
Confederation Life.
Policyholders Mutual Life.
North American Life.

In view of the results thus far secured, Dr. Frankel spoke at length upon the need of an active campaign during the summer to interest other life insurance companies and fraternal orders. To this end he suggested that committees be appointed to attend the meetings of the American Life Convention and the National Fraternal Congress, to be held during the summer. He stated that during the winter he had spoken to Dr. Gerard, the president of the National Fraternal Congress, who was cordial in his attitude and believed that it would be possible to interest the individual societies of the National Fraternal Congress to become corporate members of the Association.

Dr. Frankel concluded his remarks with an urgent appeal that each director take a personal active interest in the work of the Association and endeavor to secure not only corporate members but individual members. He suggested that a letter be sent out by each member of the Association, connected either with a fraternal order or a life insurance company, to the officers of the fraternal order or life insurance company, to which he might belong, asking that the organization might become attached to the Association as corporate member.

---

* Since the meeting, the Federal Life and Illinois Life of Chicago, and the Fidelity Mutual of Philadelphia have joined.

It was voted that a committee composed of the president, the treasurer, and Dr. Evans, communicate with life insurance associations with a view to securing representation at their meetings and of securing their coöperation.

It was voted that every director be requested to bring the question of corporate membership to such home offices of insurance companies and fraternal organizations as are situated in his district. Upon motion of Dr. Frankel it was voted that a letter be sent to every member of the Association asking him to communicate with the grand lodges of such fraternal organizations of which he may be a member.

The secretary was instructed to furnish a list of the companies to each director, and also a memorandum concerning the procedure of obtaining corporate memberships.

⁂

The president and secretary reported conferences with Mr. Hockenbury, of Harrisburg, Pa., concerning a campaign for increased memberships and for increased donations to the Association. Dr. Frankel also outlined briefly a proposition of Mr. Simpson, of New York City, for a compaign relating to methods of publicity. No action was taken upon either of the plans submitted.

⁂

Administrative Force.—At this point Dr. Frankel stated that if the Association was to continue and to grow, it was necessary to completely reorganize its administrative force. Up to the present, owing to limited funds, the Association was unable to engage but one secretary, who was assigned manifold functions. Among other things, he was the Administrative Head, Editor of the JOURNAL, the Membership Solicitor, the Publicity Manager, and the Advertising Man. In Dr. Frankel's opinion, the Association should gradually place each of these functions in the hands of an expert. This meant, of course, an increase in the administrative staff. For the present it was desirable to limit this increase in staff to the engagement of one field secretary who should spend his time during the summer in attempting to secure corporate and other memberships. If funds permitted, another such field secretary might be employed.

Upon motion of Dr. Dowling it was voted that the Executive Committee be authorized to employ some one for promotion work forthwith, and a second person if results warrant.

⁂

At this point Dr. J. D. Robertson extended an invitation to the directors to visit the Municipal Tuberculosis Sanatorium. It was voted to accept this invitation with thanks.

Dr. Evans presented a plan for reorganization of the Association. Upon the motion of Dr. Sumner it was voted to appoint a committee to re-draft the constitution. Dr. Evans was appointed chairman of this committee with power to add.

The secretary indicated the status of the move to incorporate the Association and presented a resolution designing to conclude the procedure.

However, upon the motion of Dr. Evans it was voted that the Board of Directors recommend to the annual meeting of the Association that the matter be concluded by the vote of the Association and that in the meanwhile the laws of Massachusetts be investigated as to requirements concerning the place of annual meeting.

It was voted that the advisory editorial board be requested to investigate the cost, makeup, and other contingencies of a popular public health journal and report at the next meeting of the directors.

It was voted to provide a commercial exhibit at the next annual meeting and to instruct the Executive Committee to proceed forthwith.

It was voted that we extend a vote of thanks to Dr. A. R. Reynolds and to Mr. Will C. Braun for their generous efforts in this connection.

The meeting then adjourned.

PUBLIC HEALTH NOTES

Abstracts by M. P. Horowitz and David Greenberg.

Growth Promoting Properties of Corn and Wheat.—The "highly milled" products are without exception inferior in dietary value, as regards growth, to foods prepared from the whole grain. "White" bread made from "highly milled" flour was found to be deficient in antineuritic and fat soluble vitamine, and also deficient in adequate protein and inorganic salts. The authors conclude that bread made from "whole wheat" flour or old-fashioned corn meal should be used in preference to "white" bread and "highly milled" corn foods, whenever the diet is restricted to these cereal foods to the more or less complete exclusion of other foods possessing greater dietary values.—Voegtlin, C., and Myers, C. N., *Public Health Reports*, May 31, 1918, p. 843. (*D. G.*)

⁂

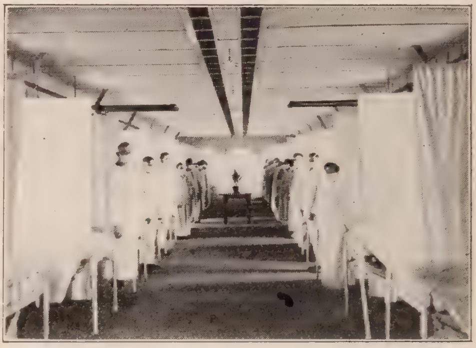
The Problems of Nutrition.—At this time, when the food problem is so important to millions of people all over the world, it is worth while to state a few facts regarding nutrition which have been brought out by recent investigations. It is now definitely known that animal foods are no longer the staple foods for protein or fat but that much of the food energy can readily be obtained in vegetable products. It is also known that carbohydrates have a superior value in muscular activity. One of the interesting facts recently brought forth is that the energy output of the body is independent of the condition of the body. Even if the individual has been fasting, the energy call to do a certain piece of work will be the same as though he were in the best nutritive condition. Professor Lusk proved the same point, when he demonstrated that the amount of energy required to do a certain piece of work is fixed, or in other words, requires a definite amount of food, regardless of the nutritive condition of the organism.

It has also been proved that, if the body is placed under conditions favoring a rapid loss of heat, energy will be liberated in excess of the requirements of the work itself.

Two other points recently brought out are that the sedentary or brain worker does not require any supplementary rationing, and that war bread does not produce any pathological results. —*The Lancet*, London, England, April 27, 1918. (*M. P. H.*)

⁂

Face Mask in Communicable Disease.—The accompanying illustration shows the method of guarding against cross infection employed at the base hospital at Camp Grant, Illinois. "Wrong diagnosis in the examining room," writes Major Joseph A. Capps in the *Journal of the American Medical Association* for March 30, 1918, "may place measles to a scarlet fever ward, or meningites in a clean diagnostic ward."



The cubicle system, now extensively used in Army hospitals, consisting of sheets suspended upon wire between the beds, restricts the dissemination of droplets while the patient is in bed. At Camp Grant, when the patient leaves the bed, he is required to don the cheese-cloth face mask.

The system is said to be very effective in preventing cross-infection.

⁂

Epidemic Poliomyelitis.—In the *Boston Medical and Surgical Journal* for May 30, 1918, there appears a report of the meeting of the College of Physicians of Philadelphia, held on December 6, 1917. Among others who appeared at the meeting to discuss epidemic poliomyelitis were Dr. Simon Flexner, Dr. Haven Emerson, and Dr. C. H. Lavinder. The disease is becoming more prevalent and is likely to be one of the most important epidemic diseases of childhood. Wickham showed that the disease is not associated with paralysis in a majority of cases during epidemic times. Normally, however, it is a disease of the central nervous system affecting the meninges and grey matter of the spinal cord and brain. A minute anærobic microörganism has been secured which is supposed to be the causative agent of the disease. This, however, needs confirmation. It is known, however, that the infectious agent enters and leaves the body by the upper respiratory mucous membrane, and is probably transmitted from one person to another essentially through contact. Lumbar puncture in suspicious cases, assists in the diagnosis very much. Six weeks is assumed to be the proper period for isolation and hospitalization seems to decrease the case incidence of the disease. It is unwise to try to prevent adults from traveling when the disease is prevalent. Instead one health officer should notify another of the departure of every child under sixteen. Popular educational publicity is exceedingly important not only in combatting this disease, but other diseases of childhood.

(*M. P. H.*)

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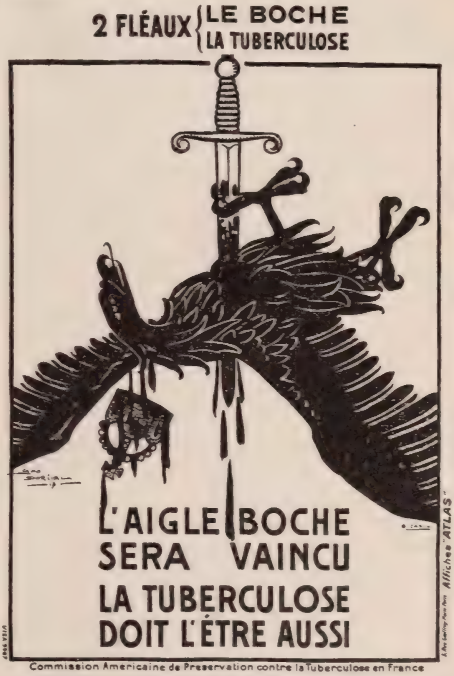
Wanted: Food Poisoning Specimens.—In food conservation work one of the most important problems is the determination of safe and unsafe foods. All the available food must be preserved and utilized, and methods must be devised which make for efficiency. This has been made a special research problem by the Department of Preventive Medicine and Hygiene of the Harvard Medical School under a grant from the National Canners Association.

During the past year an effort has been made to get in touch with outbreaks of food poisoning and infections in order that definite knowledge might be obtained as to the origin of these cases. To be of value, reports and investigations must be immediate or else little material can be obtained, and no definite conclusions can be drawn. It has been difficult to get into immediate touch with outbreaks of food sickness, and a renewed effort is being made during the second year of the work with the hope that those individuals who are in a position to do so will immediately report the occurrence of any cases of sickness attributed to food. In this problem there must be great dependence upon those who are practising physicians or health workers and who by the very nature of their work are the first to come in contact with such cases.

If there occurs in your community any case, or cases, which you think are attributable to food in any way, will you not telephone (charges reversed) the Department of Preventive Medicine and Hygiene, Harvard Medical School, Boston, Mass.; telephone, Brookline 2380. It is equally important that you save all specimens of feces and vomitus from the affected individuals, and as large portions as possible of suspected foods. An investigator will then be sent out without expense to the community, and an effort will be made to establish the cause of the trouble.



The boche eagle shall be vanquished; tuberculosis also.

French Anti-Tuberculosis Cartoons.—The cuts on this subject appearing in this issue are from the Tuberculosis Commission to France of the International Health Board. They have been sent through the courtesy of Prof. S. M. Gunn.

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Home Care in Tuberculosis.—It is estimated that there are at least 2,000,000 living cases of tuberculosis in this country, of which 200,000 are in an advanced stage of the disease. Since there are less than 50,000 beds in institutions and sanataria for the treatment of the tuberculous, the country is face to face with the great problem of caring for those who are not in institutions. Is it possible to treat these cases at home? The results of various studies demonstrates that home care, including frequent medical and nursing attendance, instruction in home economics, specially equipped sleeping arrangements, proper care for the child members of the family, sufficient material relief whenever necessary, together with sympathetic and careful guidance of a trained social worker or nurse—under these circumstances—the tuberculous patient in the home can be treated as satisfactorily as in a sanatorium, at no greater expense. Nevertheless, the *Journal of Outdoor Life* believes that institutional care rather than home care of the tuberculous should be emphasized. To obtain the ideal conditions for treatment in the home is indeed extremely difficult.—*Journal of Outdoor Life*, June, 1918. (*M. P. H.*)

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Controlling Tuberculosis in Kent.—The County of Kent, England, has been divided into four districts for the control of tuberculosis. In all there are twenty dispensaries which serve as centers for the diagnosis and observation of cases. Of late, the dispensaries have been used considerably for consultation purposes, the physicians sending many doubtful cases for diagnosis. A certain amount of educative work is carried on at the same time, at all the dispensaries. Specimens of sputum are also examined. Patients requiring sanatorium treatment are treated at the county institution where forty-seven beds are provided. The great difficulty, however, comes in the placing of the recovered patients in suitable work and under proper housing conditions. Much attention is also being given to the problem of contacts, and the recognition of incipient tuberculosis in children. It is maintained that the question of real prevention of tuberculosis is intimately bound up in child welfare.—*The Medical Officer*, April 6, 1918. (*M. P. H.*)

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Philadelphia Makes a Sanitary Survey of Schools.—In a survey of the schools, conducted by the Philadelphia Department of Public Health and Charities, 1,500 classrooms were found to be prejudicial to the health and safety of the pupils. Over 400 rooms lacked sufficient air space and in the same number of rooms, the ventilation facilities were very poor. In 500 rooms there was inadequate light due to insufficient window space. Bad overcrowding was found in 350 rooms. The toilet sanitation was poor in 40 buildings. The drinking water accommodations were poor in 10 schools. The exits were inadequate also in 10 schools. In three schools the fire escapes were unsatisfactory, and in 60 schools proper playground facilities were lacking.—*Municipal Journal*, May 4, 1918. (*M. P. H.*)

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Proprietary Medicines.—Those interested in the patent medicine evil will find the results of a special investigation made by L. C. Scott on "Druggists and Proprietaries," which appears in the *Quarterly Bulletin of Louisiana State Board of Health*, March, 1918, extremely helpful. Some of the author's findings are (1) that the majority of pharmacists are opposed to patent medicines on ethical grounds, but they are compelled by public demand to carry them; (2) that the opinion of pharmacists is divided on the question of whether a drug store could exist without the sale of patent medicines or proprietary remedies. Many seem to hold the opinion that it would be possible if all were of the same mind; (3) that the sale of patent medicines is mainly dependent on newspaper advertisement, and were it possible to suppress this, probably 75 to 80 per cent of the demand would cease. (*D. G.*)

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The Framingham Health Demonstration.—The first monograph of the *Framingham Community Health and Tuberculosis Demonstration* has just been published, and contains a complete outline of the plan and scope of the work, and its organization. Over 5,000 people, or one third of the population, have been given a thorough medical examination, to the end that organic defects might be recognized and that incipient cases of tuberculosis isolated. A complete sanitary survey of the city has been made, which included the study of school hygiene and sanitation; industrial hygiene and sanitation; welfare work in industries, in the home, and in the care of infants; the milk supply, including a wholesale tuberculin testing of cows, and the question of pasteurization; other food supplies, food stores, and lunchrooms; rural sanitation; vital statistics, including an analysis of records for ten years, a checking up of birth registration, and an attempt to learn the exact tuberculosis death-rate by a social investigation; a sickness survey; a privy and well census, and a survey of conditions relating to the breeding of flies and mosquitoes; a housing study; a Von Pirquet tuberculin survey of children between the ages of one and seven years; the working out of tuberculosis standards; a thorough organization of local health work; and a campaign to spread the gospel of good health by exhibits, lectures, organizations, demonstrations and other accepted methods in health education. The executive officer of the experiment is Dr. Donald B. Armstrong. (*M. P. H.*)

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Municipal Drug Addict Clinic.—What is perhaps the first municipal drug addict clinic has been established at Newark, N. J., by the Department of Health. The clinic is held three times a week. It is free to all sufferers from narcotic addiction, and actual treatment is given. "The theory underlying the principles here given is that the drug addict is suffering from a chronic toxemia. The aim of treatment is to withdraw the accustomed drug with a minimum of distress, in order to make possible the restoration to health without necessitating physical restraint, by the substitution of a milder narcotic, rapid reduction in dose and dilution of the toxic agents and their elimination." The coöperation of the Police Department has been obtained in the endeavors to bring drug addicts to the clinic.—*American City*, May, 1918, p. 437. (*D. G.*)

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The social problem in its widest aspect is simply the problem of human happiness. Making life varied, interesting, and full of zest necessarily rests upon the possibility, not alone of eliminating disease, but of creating a reservoir of physical vitality which will render attractive the various pursuits and activities through which happiness is alone obtained. The happy life is the one in which there is a well balanced expenditure of energy. Fatigue, disease and lowered vitality make for a general drabness and meanness of life because effort then becomes irksome. —F. N. Stapleford: "The Physician as a Factor in Social Efficiency."

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Causes of Infant Mortality.—Analysis of the statistics of the mortality of infants in New York State shows two striking points: (1) Over 55 per cent of the total mortality of children of Russian, Austrian, Polish and Italian mothers was caused by measles, whooping-cough, bronchitis, pneumonia, bronchopneumonia and infantile diarrhea; (2) about 43 per cent of the mortality of children of native mothers was from congenital debility, premature birth and malformations. Therefore, when dealing with the foreign group of mothers the problem confronting us is one of proper feeding and sanitation, while with the native element the causes requiring attention are those resulting from wrong prenatal conditions.—*N. Y. Health News*, May 1918, p. 119.

(*D. G.*)

Chouette! un crachoir!

Translation:—(Above.) "Spitting on the ground is prohibited."

(Below.) Capital! Here is a cuspidor!

Late Effects of Venereal Diseases.—The following table from the *Report of the Royal Commission on Venereal Diseases* illustrates the comparative death-rates in 150 families wherein syphilis was known to exist and in 150 poor families from which known cases of syphilis were excluded:

	Number of families studied	Number of pregnancies	Miscarriages and stillbirths	Deaths in infancy	Live children diseased	Healthy children
Group I (syphilis known to exist)						
Number	150	1,001	172	229	390	210
Results per 100 pregnancies		100.0	17.2	22.9	39.0	21.0
Group II (known cases of syphilis excluded)						
Number	150	826	78	94		654
Results per 100 pregnancies		100.0	9.4	11.4		79.2

(*D. G.*)

Omaha Quarantines Venereal Disease.—An ordinance recently passed by Omaha makes it unlawful to expose another person to venereal infection, or to communicate the disease to another person. Physicians, nurses, and hospital attendants are required to report all cases of the disease coming to their attention and places a penalty for failing to do so. Names reported to the Health Department shall be confidential. The Health Officer is empowered to isolate or quarantine persons infected with the disease.—*Toledo City Journal*, May 18, 1918. (*M.P.H.*)

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Sanitation by Aeroplane.—As sanitary officer of the aviation camp at Gerstner Field, Louisiana, I have to make frequent inspections of various parts of the camp, supervising drainage, filling, or oiling in mosquito work, the operation of the incinerator and similar duties. The most efficient way to accomplish these duties has proved to be by means of the aeroplane, riding as an observer. From the air a view of the entire camp is obtained and the nature of the work being done by the sanitary squads may be seen at a glance. Upon alighting the sergeant in charge can be sent to correct or direct the work. The plane is also used for travel to distant points of the field, or to the gunnery school several miles distant. I believe that this is one of the first instances where the aeroplane has served as a regular aid to sanitation.—James A. Tobey, 1st Lieut., S. C., N. A.

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Acute Infectious Jaundice in the United States.—Acute infectious jaundice has become particularly conspicuous because of its prevalence among the troops in Europe. It is a disease which was not entirely unknown in this country before. The disease is characterized by malaise, prostration, and gastrointestinal symptoms at onset, by fever of varying degree and by jaundice of varying intensity and duration. It is distributed practically all over the world and is supposed to be due to Spirochæta icterohæmorrhagiæ discovered by Inada and his coworkers in 1916. There have been various outbreaks of the disease in this country, and it seems that all ages and both sexes are generally affected. Although many people may have the disease, the fatality rate is very low. At the present time, it is not possible to link up the disease with occupation, and it is not definitely known what the conditions of food supply, water supply, sewage disposal and other factors in sanitation were, when the disease appeared in this country. Before the war, the disease seemed to occur especially among troops, sewer workers, mine workers and in agricultural laborers working in wet soil. The causative agent has been found on wild rats, and so the rodent has been linked up with the disease. It is believed, however, that no insect plays a part in spreading the disease. The weight of opinion seems to favor the spread of the disease by contact, the spirochætes being interchanged among rats and men, under poor sanitary conditions by means of their urine.—*Public Health Reports*, May 10, 1918. (*M. P. H.*)

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Special Course for Public Health Nurses.—The health problems created and intensified by the war have made more urgent than ever the demand for well-equipped women to do infant welfare work, anti-tuberculosis work and industrial nursing. In order to assist in meeting this need the Visiting Nurse Association of New Haven has planned to develop and extend the course of special training for public health nurses which it has offered for the past four years.

Through the coöperation of the faculties of the Medical School and the Graduate School of Yale University it has been possible to provide a course of broad and fundamental character, including five months theoretical instruction and four months of field practice. The theoretical instruction will consist of courses in general public health nursing, public health and hygiene, vital statistics, bacteriology, child welfare, school nursing and dispensaries, tuberculosis, mental hygiene, industrial hygiene, sociology, home economics and nutrition, and educational psychology. For the field practice arrangements have been made whereby the students will get experience in branches of public health work not carried on by the Visiting Nurse Association, such as industrial nursing, mental hygiene, school nursing, and medical and social service work in hospital and dispensary. A certificate will be given to students completing the course. Nurses desiring to take the course should apply to Miss Mary G. Hills, 200 Orange St., New Haven, Conn. (*D. G.*)

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Venereal Disease Control.—In twenty-four states definite arrangements have been made to coöperate with the U. S. Public Health Service in a program to control venereal diseases, and twelve other states have expressed a wish for such coöperation. In practically all of the twenty-three states regulations have been passed which provide ample authority for dealing with the problem according to the plan approved by the Surgeons General of the Army, Navy, and Public Health Service. The campaign in these states follows four principal channels:

(1) Educational: Acquainting the public with the nature of the diseases and the objects desired to be accomplished.

(2) Law enforcement: Securing coöperation of the physicians in reporting cases, and of the police in apprehending prostitutes, vagrants, and such other persons as can be reasonably suspected of having venereal disease in communicable stages.

(3) Propaganda to secure local funds for providing detention homes and hospital facilities for isolation and treatment of venereal-disease carriers who by their habits are a menace to the public health.

(4) Establishment of increased facilities for early diagnosis and treatment.

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Annual Conference of United States Public Health Service.—At the sixteenth annual conference of state and territorial health authorities with the United States Public Health Service, held in Washington on June 3 and 4, a number of important matters relating to the war were discussed. The members of the conference were especially concerned with the influence on public health of the expected shortage in the medical profession. It was the sense of the conference that there must be some reorganization of medical services in the different communities, aiming at the extension of the health center idea with hospital and clinic units. A committee was appointed to take up with the Conference of State and Provincial Health Authorities the question of maintaining the efficiency of Federal, state, and local health agencies during the war.

Among the resolutions passed may be mentioned those endorsing the principle of Federal aid extension in rural sanitation, a federal system of supervision of the health of war industrial centers through coöperation of the Public Health Service with state and local health and labor authorities, and the principles of the Chamberlain-Kahn Bill in regard to meeting the venereal disease problem.

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United States Public Health Service Activities.—To secure better protection of the health of industrial workers, the United States Public health Service has recently undertaken on a large scale sanitary surveys of plants producing war materials. This work is an extension of previous studies of measures for medical and sanitary care of employes in such industries, and of surveys of hygienic conditions in navy yards. On the basis of the surveys recommendations are made to minimize the risk from industrial hazards and improve the hygienic conditions of the plants. In connection with this work, the Public Health Service is conducting studies of trinitrotoluol poisoning and of industrial fatigue.

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Federal Health Activities Unified.—A most important executive order issued by President Wilson places federal public health activities under the Secretary of the Treasury. In effect, this will broaden the scope of work of the United States Public Health Service. The order does not apply to the health activities of the Army, Navy, Provost Marshal General and certain functions of the Bureau of Labor Statistics, embracing industrial hygiene investigations.

The order, as published in the *Official Bulletin* of July 2, 1918, reads as follows:

WHEREAS, In order to avoid confusion in policies, duplication of effort, and to bring about more effective results, unity of control in the administration of the public health activities of the Federal Government is obviously essential, and has been so recognized by acts of Congress creating in the Treasury Department a Public Health Service, and specially authorizing such service 'to study the diseases of man and the conditions influencing the propagation and spread thereof' and 'to coöperate with and aid State and municipal boards of health':

"Now, therefore, I Woodrow Wilson, President of the United States, by virtue of the authority vested in me as Chief Executive, and by the act 'authorizing the President to coördinate or consolidate executive bureaus, agencies, and offices, and for other purposes, in the interest of economy and the more efficient concentration of the Government,' approved May 20, 1918, do hereby order that all sanitary or public health activities carried on by any executive bureau, agency, or office, especially created for or concerned in the prosecution of the existing war, shall be exercised under the supervision and control of the Secretary of the Treasury.

"This order shall not be construed as affecting the jurisdiction exercised under the authority of existing law by the Surgeon General of the Army, the Surgeon General of the Navy and the Provost Marshal General in the performance of health functions which are military in character as distinguished from civil public health duties, or as prohibiting investigations by the Bureau of Labor Statistics of vocational diseases, shop sanitation, and hygiene."

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Nursing Publications Combined.—The *Bulletin* of the National Association for Public Health Nursing has been combined with the *Quarterly*. The new magazine, *The Public Health Nurse*, will be issued monthly.

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MAINE PUBLIC HEALTH NOTES.

The states of Maine and New Hampshire are coöperating with the United States Public Health Service in the establishment and control of a sanitary zone around the Portsmouth-Kittery Navy Yard. At present the towns in Maine, which are included in this district are Kittery, York, Elliot, South Berwick and Berwick. Dr. Paul Preble, passed assistant surgeon of the United States Public Health Service, has been appointed as deputy state health officer of Maine for the sanitary district in this state. He will have under him the necessary clerical and laboratory assistants, as well as field inspectors, and public health nurses.

The State Department of Health is coöperating with the United States Shipping Board and the city of Bath for the support of a full-time health officer of the city of Bath. On account of the great increase in population in that city, due to the shipping industry, acute sanitary problems have arisen which demand immediate attention from the standpoint of a well-qualified health officer and laboratory worker. Under the supervision of the health officer will be a branch laboratory of the State Department of Health in the city of Bath.

At the last meeting of the Public Health Council of Maine it was voted to establish a division of venereal diseases in the State Department of Health.

Dr. L. D. Bristol, state commissioner of health, has recently been appointed on the following committees: Chairman of the State Committee for the American Association for the Control of Cancer; Member of the Executive Committee of the Conference of State and Provincial Health Officers of North America; Vice President of the National Tuberculosis Association to represent Maine at the New England Tuberculosis Conference.

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MASSACHUSETTS PUBLIC HEALTH NOTES.

The following changes in the personnel of the State Department of Health are announced:

Dr. George T. O'Donnell, State District Health Officer, has been transferred to the Connecticut Valley District, with headquarters at Springfield.

Dr. Lyman Asa Jones, transferred to the Northeastern District, with headquarters at Swampscott.

Dr. Arthur A. Brown, State District Health Officer, has been transferred to the South Midland District, with headquarters at Worcester.

Dr. Merrill E. Champion has been appointed Director of the Division of Hygiene.

New appointments of particular interest in connection with the venereal disease campaign of the Massachusetts state department of health:

At the request of the commissioner of health, Captain Alec N. Thomson, Medical Reserve Corps of the Section for Combating Venereal Diseases, Office of the Surgeon General, War Department, has been detailed to the State Department of Health for a period of three months. Captain Thomson has had a wide experience in establishing and conducting venereal clinic activities in the Army, and before he entered the service was director of the Venereal Clinic at the Brooklyn (New York) Dispensary. In the position of temporary chief of the Sub-Division of Venereal Diseases he will be occupied with the details of the establishment and operation of the State Approved Venereal Disease Clinics.

In this connection it is also announced that Dr. Mary A. Lakeman of Salem has been appointed epidemiologist in the Sub-Division of Venereal Diseases. Dr. Lakeman's principal activities will be the organizing and coördinating of follow-up systems in the State Approved Venereal Disease Clinics.

Dr. W. C. Woodward has resigned as Health Commissioner of the District of Columbia, in order to become Health Commissioner of Boston. He succeeds Dr. Francis X. Mahoney.

Dr. John Weinzirl, formerly of Harvard, Medical School, has been elected secretary of the Washington (state) Association for the Prevention and Relief of Tuberculosis.

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MINNESOTA PUBLIC HEALTH NOTES.

Fumigating Dispensed with in Minnesota.—At its last meeting, the Minnesota State Board of Health expressed itself as opposed to terminal fumigation in infectious diseases, and urged the substitution of thorough practical house-cleaning. Therefore, local boards of health are at liberty, by their own regulations, to continue requiring terminal fumigation for release of quarantine in such cases as they see fit, but this is no longer required by state regulations.

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The Minnesota State Board of Health at its recent meeting, created a Division of Tuberculosis and a Division of Child Conservation. This makes seven divisions.

Dr. O. J. Chesley, director of the Division of Preventable Diseases, Minnesota State Board of Health, sailed for France early in June to engage in the Red Cross anti-tuberculosis work in the civilian population.

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Venereal Disease Work.—The Minnesota State Board of Health has begun its campaign for the control of venereal diseases under the leadership of Dr. H. G. Irvine, of Minneapolis, who is director of the division.

The educational work is in charge of Dr. Mabel S. Ulrich, who has been engaged in social hygiene educational work for some years.

The social service and protective work is being organized by Miss Charlotte G. Ashbrook, who had considerable experience in social work with venereal cases in Philadelphia.

Arsenobenzol is now being distributed for treatment of indigent syphilitics in the infectious stage. The principal hospitals and dispensaries of the Twin Cities were the first to use this free product. In the rural communities it will be distributed through the health officer or directly to physicians.

The coöperation of law enforcement officials and medical officers of military training places has been secured, and infections of soldiers have been followed up by the arrest of prostitutes reported as the source of such infections.

Prostitutes are being held for medical examination without bail and committed for workhouse sentences. Inmates of corrective and penal institutions in the Twin Cities have been examined and infected cases put under treatment. Those whose terms expire while they are in the infectious stage will be held under treatment in quarantine until they are no longer a menace to public health.

An educational campaign for the purpose of reaching normal schools and teachers, has already been undertaken. The coöperation of Parents' and Teachers' Associations, and the Women's Council of National Defense, have also been enlisted in the social hygiene educational propaganda, which is being carried out under the supervisor of educational work. Exhibit material has been prepared and circulated. Some fifty thousand pamphlets have been secured, and are being widely distributed throughout the state.

The Minnesota State Board of Health is, in short, undertaking the work of venereal disease control on a very broad basis. The work of the Division of Venereal Diseases includes not only medical, but social service and educational activities, and in addition to this a very active coöperation with city authorities in the carrying out of law enforcement measures.

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MISSISSIPPI PUBLIC HEALTH NOTES.

Dr. W. S. Leathers, secretary and executive officer of the Mississippi State Board of Health and director of Public Health for the State of Mississippi, was elected unanimously to the office of president of the Mississippi State Medical Association in session at Jackson, Miss., May 15.

With the distribution of 30,000 bulletins issued by the Mississippi State Board of Health on "Save the Babies," and the coöperation of every public health officer and club woman of the state promised, Mississippi's Baby Welfare Campaign is already well on the road to success. Activities in behalf of this effort are not confined to the club women and public health officials by any means. Circulation of the bulletin, speeches in behalf of the campaign at church society getherings and social meetings throughout the state, help in getting the proper birth certificates promptly to the local registrars, are only a few of the many ways individuals can do their bit. Dr. R. W. Hall, director of the Bureau of Vital Statistics, has sent out hundreds of letters from his department of the State Board of Health to the club women, urging them to give special attention to the campaign, and the greatest interest is being manifested throughout the state in the baby welfare campaign.

There is a heavy call from all parts of the state for the prophylactic typhoid vaccine made in the hygienic laboratory of the Mississippi State Board of Health, and Dr. C. R. Stingily, the director of the laboratory, has felt constrained to say that the demand for vaccine this year has been heavier thus far than it was during the entire year of 1917. The vaccine manufactured by the State Board of Health is made according to the method used by the United States Army, and is furnished free by the state to any physician in the state who calls for same.

For more than a month two representatives of the Federal Bureau of Vital Statistics at Washington have been in the department of Vital Statistics of the Mississippi State Board of Health, examining the records to determine whether or not Mississippi will be admitted into the Federal registration area. Immediately following the work on death registration, they will take up the efficiency of the registration of births. Dr. R. W. Hall, director of the department of Vital Statistics, has inspected the counties of Simpson, Hinds, Rankin, Forrest, Winston Newton, Choctaw, Attala, Leflore, Bolivar, Quitman and Coahoma, visiting every local registrar in each county. Letters have been sent by the Bureau of the Census to ministers, postmasters, mail carriers and others in every county, in an effort to secure the absolutely correct information in regard to all birth certificates.

The State Tuberculosis Sanatorium at Magee, Miss., under the direction of the State Board of Health, with Dr. Henry Boswell, superintendent, opened in December, 1917, and all of the fifty beds are occupied and there is a long waiting list and the demand grows daily for admittance into the institution. Contracts have recently been let for additional buildings and enlargements of the scope of activities. The legislature made an appropriation for the building of the institution and an annual appropriation for the upkeep.

The State Hygienic Laboratory is now making the Wassermann test for any physician in the state. Last year the laboratory completed over twenty-two thousand examinations and it is thought that the Wassermann test will cause a very great increase in this number.

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OHIO PUBLIC HEALTH NOTES.

New venereal disease regulations of the Ohio State Department of Health went into effect July 1. They require: reporting of cases, with the name of victim and source of infection; quarantine in cases where it is deemed necessary by the state commissioner of health; medical examination of persons suspected of having a venereal disease, in which class are placed prostitutes and persons associating with them, and coöperation of health officials in measures for the repression of prostitution.

The Ohio department has installed a Bureau of Venereal Diseases, under the direction of Dr. H. N. Cole of Cleveland, who is giving his services free in the absence of state funds for venereal disease work. Wassermann examinations have been made by the department laboratories since April 1. More than 1,400 such tests were made during April, May and June.

The first three pamphlets of a venereal disease series have been issued by the department. These three are: "Some Things a Young Man Ought to Know About Sex and Sex Diseases," "How Any Boy Can Develop His Health and Strength," and "Instructing Your Child in the Facts of Sex." Pamphlets for girls and young women are in preparation. Educational placards are also being used. A circular letter asking coöperation has been sent to the physicians of the state.

Whooping-cough was made a quarantinable disease in Ohio by regulations which went into effect July 1. Heretofore the state regulations had required reporting of whooping, but had left the question of quarantine to the discretion of local health authorities. Provision is made in the new regulations that children having whooping-cough may go into the streets, under supervision of a responsible person, if they keep at a minimum distance of five feet from children under fifteen years old and wear arm-bands marked "Whooping-Cough."

Dr. Allan W. Freeman, Ohio state commissioner of health, has been commissioned as a major in the Medical Reserve Corps and for the past few weeks has been awaiting his call to active duty. He will be on leave of absence from his official duties for the period of his military service. Dr. Freeman began a five-year term as head of the recently reorganized State Department of Health of Ohio on October 1, 1917.

Dr. Frances M. Hollingshead, director of the Division of Child Hygiene in the State Department of Health, left that position on an indefinite leave of absence July 1 to engage in child welfare work under the American Red Cross Children's Bureau in France. She is the fourth division head of the department to leave for war service.

Counting Dr. Freeman and Dr. Hollingshead, the Ohio State Department of Health has sixteen members of its staff in war service of one form or another.

A movement to reduce Ohio's typhoid fever prevalence is in progress this summer. A "typhoid fever number" of the *Ohio Public Health Journal*, the State Health Department's official organ, issued in May, discussed the problem in its various phases and urged local health authorities to coöperate with the state in controlling the disease. Ohio's typhoid mortality rate in 1917 was 13.1 per 100,000—the lowest rate on record in the state.

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TENNESSEE PUBLIC HEALTH NOTES.

Dr. R. Q. Lillard, secretary of the State Board of Health since 1913, resigned on June 1. Dr. Olin West. director of the Bureau of Sanitation for several years, was chosen to succeed Doctor Lillard as secretary and executive officer.

Dr. H. H. Shoulders, registrar of Vital Statistics of the Tennessee State Board of Health for the past five years, resigned on June 1, having entered the Medical Reserve Corps of the United States Army, in which he holds a commission as Captain.

Dr. A. V. Keebler, field director of the Bureau of Sanitation of the Tennessee State Board of Health, is now serving in the Medical Reserve

Corps of the Army with a commission as Lieutenant.

Dr. W. S. Rude, for four years a field director of the Bureau of Sanitation of the State Board of Health, has resigned to enter private practice.

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VIRGINIA PUBLIC HEALTH NOTES.

Dr. Lewis E. Harvie, a member of the Virginia State Board of Health for twenty-five years having been a member of the old board before the reorganization in 1908, died at his home in Danville, Va., on June 17. He had been a resident and practicing physician of Danville for more than forty-seven years. He belonged to the old school of gentleman and doctor, but was keenly alive to the progress made in his profession and kept well abreast of the times.

The first sanatorium in the South for the treatment of negro consumptives, the Piedmont Sanatorium, has been opened in a beautiful location near Burkeville, Va. The staff and equipment are adequate for the care of forty-patients at present, which will be increased to eighty in the next three months.

Under the direction of the State Board, a sanitary inspection of the state was started the last week in June. It will be conducted in the field by a number of advanced medical students who will follow itineraries and make investigations under the supervision of the commissioner. The inspection will cover every phase of public health problems and will not be completed for probably two years. The results obtained will be made the basis of a report to the state legislature looking to possible legislation in the interest of public health work.

A state-wide health campaign has also been begun. In addition to the customary channels, other forms of publicity will be employed, especially letters to state, city and county officials, calling upon them to enforce the health laws and support public health work. A number of physicians and nurses will spend the greater part of the summer lecturing and demonstrating at the several normal schools in Virginia in an effort to reach teachers in the most effective way.

The Bureau of Vital Statistics of the State Board has successfully prosecuted the fifth physician for failure to report births in conformity with the law. He is Dr. W. H. Lewis, of Lawrenceville, Va.

Alvah S. Holway has been appointed acting chief engineer to the board in place of Richard Messer, who was called from his work here into the Federal service. Mr. Holway was until recently associated with I. W. Pratt, consulting engineer, of Cleveland, Ohio. He is a graduate of Dartmouth College and of the Massachusetts Institute of Technology.

Dr. W. A. Brumfield has relinquished his post as assistant commisssioner to become acting assistant surgeon of the United States Public Health Service, with headquarters in Richmond, Va.

Under the direction of Miss Agnes D. Randolph, executive secretary of the Virginia Anti-Tuberculosis Association, a summer campaign has been begun for the care of the men rejected by the draft boards and the men sent home from the cantonments as being tubercular. Miss Mary Summerville Gammon is field director and Miss Hulda Naw is field nurse in this work.

Dr. P. S. Schenk has been elected president of the Norfolk Medical Society.

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WISCONSIN PUBLIC HEALTH NOTES.

By appointment of the State Board of Health, Miss Katherine E. Wattawa of the laboratory staff of the Minnesota State Board of Health, has assumed charge of the state branch laboratory at Rhinelander, Wis., in place of A. A. Sliwinski, who has entered the army medical service.

Miss Olive Andrews of Oshkosh, Wis., has resigned from the staff of the Toledo, Ohio, hospital, to become subdirector of the new state coöperative laboratory at Oshkosh.

Miss A. B. Schmidt, acting health officer of Racine, Wis., has been ordered to report at the Red Cross camp at Nitro, W. Va., for service as a nurse in army camps. City officials were unsuccessful in efforts with Washington officials to retain her until next fall to permit fulfillment of plans for baby welfare work in Racine during the summer.

The Milwaukee Health Department will conduct a survey to learn the effect of factory conditions upon workers who are below and above the draft age. Notation will be made also upon sanitation and the effect which "speeding up" has had upon employes.

Basing their appeal upon the fact that 434 enlisted men have been returned to Wisconsin from cantonments because of tubercular infection, the women's committee of the State Council of Defense has addressed all county boards asking establishment of county sanatoria for the better protection of civilian health. Jefferson County was the first to respond, promptly appropriating $50,000 for a tuberculosis sanatorium. Ashland, Bayfield and Iron counties have appropriated funds for a tri-county sanatorium on the shore of Lake Superior in Bayfield County.

The commission council of Green Bay, Wis., has reëstablished the position of city nurse and reinstated the nurse, besides enlarging the functions and coördinating the office more closely with the health department. This move followed a popular protest against the council's action in abolishing the office.

The Milwaukee Health Department will establish a downtown clinic for the treatment of venereal diseases.

The Racine, Wis., health officials have established a rule that no floral tributes may be taken into a home where a death from dangerous communicable disease has occurred, and henceforth all flowers in such cases must be sent to the undertaker for conveyance to the place of burial.

Dr. S. Berglund has been appointed commissioner of health of Marinette, Wis., to fill the unexpired term of Dr. S. P. Jones, deceased.

Figures published by the Census Bureau give Milwaukee rank as tenth among large American cities having the lowest death-rates.

Dr. Gustaf Windesheim has been reëlected president of the Kenosha, Wis., board of health.

Dr. W. L. Holt, the new full-time health commissioner of Beloit, Wis., has recommended the employment of an assistant for dairy, restaurant and food shop inspection, and the publication of a health bulletin to fill a need for education of the citizens in personal and public hygiene.

Registers of deeds of Wisconsin, meeting at Milwaukee recently, urged the great need for a standardized legal blank for registering vital statistics. The diversity of form was said to hamper even the operation of the selective service law. With many forms for registering births, for example, some forms become obsolete, and a new register seeking to find the information wanted is often unable to do so, leaving the applicant without means of proving his correct age. The association adopted a resolution to petition the next legislature to adopt uniform registration blanks.

An outbreak of scarlet fever halted the baby census at Two Rivers, Wis., and weighing and measuring of children were temporarily discontinued.

The Milwaukee pasteurization ordinance is now pending in the courts, a group of milk dealers who furnish only 5 per cent of the milk sold in the city having enjoined the enforcement of the measure. Health Commissioner George C. Ruhland expects the ordinance will be upheld.

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NEW YORK STATE PUBLIC HEALTH NOTES.

The annual conference of Health Officers of the State of New York was held at the Grand Union Hotel, Saratoga Springs, June 25 to 27. The meeting was opened with an address by the State Commissioner of Health, Dr. Hermann M. Biggs, who outlined the progress that had been made since the reorganization of the Department four years ago. Dr. Biggs called attention to the increased death-rate and the decreased birth-rate in the civilian population of the belligerent countries of Europe and to the fact that there were 20,000,000 less people living in those countries than would have been living if the war had not occurred. In addition he pointed out that there were at least 10,000,000 individuals handicapped for life or totally disabled as a result of injuries and disease due to the war. He indicated to the health officers that they had it in their power to render a most conspicuous service to the State and the Nation in their chosen field of work, a service as genuine and important and far greater probably in extent than any they could render on the battle fields of France.

Governor Whitman expressed his sincere interest in public health work and emphasized his appreciation of the importance which public health bears to the happiness of the people and to the successful economical development of industries. By means of efficient public health work in New York State the death-rate per 1,000 of population has been cut exactly in half in the last twenty-five years. The Governor pointed out that this reduction means 65,000 fewer deaths and 650,000 less cases of serious illness per year, as would have been the case had the old death-rate persisted, and called attention to what this saving in life and health means to the state at the present time. The Governor stated it to be his opinion that the official, high or low, who, for the promotion of selfish political aims interferes with public health activities and administration to the detriment of their efficiency is playing with human lives. He begged the health officers in considering the question of military duty to give due weight to the fact that the health of the national army is directly dependent on the health of the civil population from which it is recruited and by which it is surrounded until it leaves this country.

Among the other distinguished guests were Dr. Simon Flexner of the Rockefeller Institute, who spoke on "Some of the Medical Problems of the War," and Dr. Rufus Cole, who discussed "Pneumonia as a Public Health Problem."

At the war service dinner of the New York State Sanitary Officers Association, Col. Victor C. Vaughan was the speaker of the evening.

The American Red Cross was represented by Mr. Alexander M. Wilson of the Bureau of Civilian Relief. During the Symposium on "Child Hygiene," addresses were made by Miss Julia Lathrop of the Children's Bureau of the United States Department of Labor, Dr. Josephine Baker, director of the Division of Child Hygiene, New York City Department of health, and Dr. Charles Hendee Smith of New York City.

"Venereal Disease" was discussed from the standpoint of the diagnostician, by Dr. John A. Fordyce of Bellevue Medical College; from the police standpoint by Major Chandler of the State Police; and from the legal standpoint, by Mr. Joseph A. Warren, counsel of the State Department of Health.

The conference was attended by 552 health officers, representing 721 health districts of the state.

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Mr. Fenimore D. Beagle, executive clerk of the New York State Department of Health, who was taken critically ill with pneumonia on April 22, is now convalescing.

Mr. Beagle has been connected with the Department for over twenty-five (25) years and has never previously lost a day through illness.

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National Safety Council Convention.—The date of the St. Louis meeting has been changed from the week of October 14, 1918, to the week of September 30. A conflict with the meetings of the American Public Health Association is thereby avoided.

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Mr. Murray P. Horowitz of the Department of Biology and Public Health of the Massachusetts Institute of Technology has been appointed instructor at Wellesley College, to give a course in public health laboratory methods. The course is designed to meet the demand for women bacteriologists.

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Menus for National Needs. *Annie L. Weeks. University of Rochester and Mechanics Institute, 1917. 15 pp. Price, 10 cents.*

In our present food crisis, the need of reducing the wheat, fat, meat and sugar in our diet is very great. How can this be done without the sacrifice of health, attractiveness and palatability? This bulletin was published as an attempt to meet this need and should prove exceeding helpful to those who must prepare dietaries. The meals are planned for a family of five, fuel values are indicated for each article of food and a number of simple recipes are also given.

D. Greenberg.

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P-Nitrophenol as an Indicator in Water Analysis.—Although methyl orange and p-nitrophenol are equally sensitive as indicators in estimating the acidity of natural waters, the color change of p-nitrophenol renders its use more suitable in the case of turbid waters. P-Nitrophenol is not altered by boiling with water under pressure.—A. Goldberg, *Chem. Ztg.*, 41, 599 (1917). *Jour. Chem. Soc.*, 112, II, 498; *Chem. Abst.*, 12, 839 (1918).

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GENERAL

Mr. George A. Johnson, consulting engineer, New York City, has been commissioned a major in the Quartermaster's Corps, National Army. He will be attached to the Construction Division, Maintenance and Repair Branch, with headquarters at Washington.

Dr. Minna Mary Rohn has been appointed health officer of the Lake George Health District, of New York State. The appointment was made on the basis of a recent Civil Service examination.

Dr. C. P. Fryer, of Jacksonville, Florida, has accepted the position of health officer of Pitt County, North Carolina.

Dr. Charles E. Low has resigned as health officer of Spartanburg, South Carolina, to become health officer of the joint board of health of Wilmington and New Hanover Counties, of North Carolina. He succeeds Dr. Charles T. Nesbitt, who has removed to Akron, Ohio.

The appropriation of the North Carolina State Board of Health for 1918 has been fixed at $4,050.

Mr. Mayo Tolman, director of the Division of Sanitary Engineering of the West Virginia Department of Health, has prepared a sanitary survey of Charleston, West Virginia. Copies can be obtained from the Charleston Survey Commission, Mr. Israel Bettan, secretary, at twenty-five cents per copy.

Dr. W. H. Coon has been appointed by the Emergency Fleet Corporation to superintend the sanitation of shipping yards.

The following persons have been appointed district sanitary engineers for the Emergency Fleet Corporation: Mr. C. E. Turner; Mr. M. K. Newman; Mr. George H. Shaw; Mr. J. L. Ludlow; Mr. Don W. Bingham; Mr. S. A. Greeley. Mr. W. S. Stevenson will be engineer at the main office in Philadelphia.

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BOOKS AND REPORTS REVIEWED

The Sanitary Code of the State of Connecticut.—The newly organized health department of the state of Connecticut has just issued Chapter I of the Sanitary Code dealing with communicable diseases. In many respects this chapter is a departure from the sanitary codes which have been issued heretofore. An exhaustive list of definitions of terms used contains such new words as *period of communicability*, *restriction of movement* and *concurrent disinfection.*

Because of the high degree of communicability of certain diseases as smallpox and poliomyelitis, special precautions against their spread must be taken and Regulation 7 provides that, "Every physician or professional attendant having under his care or observation a person with an illness presumably a communicable disease shall introduce such precautions as are necessary to prevent the spread of the infectious agent until a diagnosis is established, or report such case to the local health officer, *Provided,* when an illness is presumably cerebrospinal meningitis, diphtheria, poliomyelitis, scarlet fever, smallpox, typhoid fever, he shall report such suspected case to the local health officer without waiting for a diagnosis."

Another departure in the formulation of regulations concerning the duration of isolation of communicable diseases is contained in Regulation 15, which deals with minimum periods of communicability. For instance, the minimum period of communicability of cerebrospinal meningitis is declared to be "during the clinical course and until the specific organism is no longer present in the nose or mouth."

To minimize the loss of time of wage earners and the hardships brought about by isolation and quarantine, different regulations are prescribed. For example in dealing with such diseases as anthrax, glanders, plague, etc., Regulation 20 requires "the premises where such disease exists to be placarded and all occupants and frequenters of the same shall be quarantined until specific directions are received from the state commissioner of health." On the other hand when the disease is German measles, mumps or whooping-cough, "the person affected shall be subjected to restriction of movement, without placard of the room or premises and without quarantine."

In general the Connecticut code is very complete and is intended as a guide to the health officer and physician in controlling communicable disease rather than a narration of ordinances as are so many of our present codes.

D. Greenberg.

Report of the Chairman of the Committee on Medicine and Sanitation of the Advisory Commission of the Council of National Defense. *April 1, 1918.*

In the spring and summer of 1916 a survey of hospitals and sanatoria was instituted by the committee, with the result that information was obtained and turned over to the Committee on Medicine and Sanitation, upon its appointment, concerning the capacity of 1,700 of the leading institutions of the country, their facilities for caring for military and civilian needs, the personnel required for the successful conduct of the respective institutions, and other data of extreme importance.

In the late fall of 1916 the committee was requested by the Surgeon General's Office of the Army to assist that department in arousing the interest of the civilian medical profession in the Medical Reserve Corps, with a view to increasing enrollments in the corps to meet possible war needs.

Enrollments in the Medical Reserve Corps have been increased from 1,800 at the beginning of the war in April, 1917, to over 21,000 at the present time. Of this number more than 15,000 are on active duty.

The Committee on Standardization was authorized February 2, 1917, under the chairmanship of Dr. F. F. Simpson, for the purpose of standardizing essential medical and surgical supplies and equipment, to increase speed and reduce cost of production.

A bill was drafted which is now before Congress, providing for the vocational rehabilitation and return to civil employment of soldiers and sailors disabled in the line of duty.

In conjunction with the Committee for Civilian Coöperation in Combating Venereal Diseases, and the committee on industrial medicine and surgery, the *Child Welfare Committee* has submitted to the General Medical Board resolutions recommending that the board ask the faculties of medical schools to have the industrial diseases, prenatal and obstetrical care, infant welfare, and the venereal diseases made an integral part of the curriculum of the various medical schools, and that members of the faculties avail themselves of every opportunity to impress the importance of these problems from the public health standpoint upon the medical profession as well as the public at large. It has subcommittees on (a) The best graphic methods of teaching child welfare; (b) Food values necessary to children of various ages; (c) Best procedure to recommend to the states in respect to the midwife question in the present war emergency; (d) To consider the advisability of recommending the investigation of institutions for the care of children and the best means of making such investigations.

Advertisers and press association committees were organized by the *Committee for Civilian Coöperation in Combating Venereal Diseases* for advice and coöperation in developing public opinion favorable to the social hygiene program. The governors of all the states were communicated with, urging recognition of the emergency, and drastic action in dealing with venereal diseases. Volunteer speakers have been furnished in coöperation with representatives in civilian communities. Partially as a result of the committee's correspondence with state boards of health throughout the country, thirty-two states have adopted laws or regulations requiring the reporting of venereal diseases; eleven states have organized bureaus of divisions of venereal diseases in their health departments; at least fifteen states provide free laboratory diagnosis; at least six states provide arsphenamin free or at low cost; sixteen states are engaged in educational work; only two states have given no indications of activity in venereal disease campaign.

With the idea of being of immediate and direct benefit to the largely increased numbers of medical officers who had not had military medical experience, and to enable them the better to conserve the health and lives of the fighting men of the United States, the *Editorial Committee* has published in pocket-manual form six textbooks epitomizing the sanitary, surgical and medical experience acquired in the war, and written by men specially qualified by training and by war experience.

Realizing the relation of the alcohol problem to venereal disease, the *Committee on Hygiene and Sanitation*, in April, 1917, recommended to the War and Navy Departments that the zones around camps and cantonments be placed under military control in order to protect the troops from venereal infections, and the action of the War and Navy Departments in prohibiting the sale of alcoholic beverages within the camps and extra-cantonment zones was emphatically indorsed. This committee also has subcommittees on drug addiction, alcoholic control, public health nursing, tuberculosis, and health statistics.

The *Committee on Industrial Medicine and Surgery* is prosecuting a plan for the reduction of preventable deaths and disabilities from accidents and disease, and the provision of healthful places in which to work and healthful homes and communities in which to live.

Immediately upon its appointment in April, 1917, the *Committee on Medical Schools* took steps to survey the medical school situation, for the purpose of conserving the future supply of medical men by inducing the students to continue their medical education in order that their trained, rather than untrained, services might be at the disposal of the Government.

The *Committee on Nursing*, in addition to instituting a publicity campaign aimed to interest young women in nursing as a career in order that they might upon completion of their training fill institutional positions, thereby releasing trained nurses for duty with the fighting forces, has made a direct appeal to graduate nurses to enroll in the Army, Navy, and Red Cross Nursing Services. State committees on nursing have been formed under the woman's committees of the state councils of defense in twenty-seven states. In coöperation with the National Organization for Public Health Nursing, this committee submitted a plan to increase the supply of public health nurses to meet war needs in general, and the "children's year" program in particular.

The *Committee on Research* has conducted investigations of the conditions under which canned foods might become deleterious; of the question of protectors for the ear drum against the noises of battle; of substitutes for ambrine; of the study of antiseptics and disinfectants; of an antitoxin for the gas bacillus infections, and of many other important problems.

In addition there are committees on dentistry, hospitals, surgery, volunteer medical service corps, and women physicians, all of which are engaged in important military activities.

D. Greenberg.

INDUSTRIAL HYGIENE AND OCCUPATIONAL DISEASE

Abstract by Dr. E. R. Hayhurst, Dr. R. P. Albaugh, and Dr. P. M. Holmes.

To Safeguard Health of Munition Workers.—Announcement is made in the *Official Bulletin* for April 13, 1918, of the appointment of Dr. Kristine Mann to superintend the work of safeguarding the health of women employed in munition factories. Many workers will be needed for this service, and it is planned to obtain them by special training during the summer at a prominent women's college. It is also planned to train "doctors of industrial health" at one of the medical schools. (*M. P. H.*)

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Protection of Health of Munition Workers in Italy. Alice Hamilton in *Monthly Review, U. S. B. L. S.*, January, 1918, pp. 184–194. The Italians appear to have gone minutely into this subject in the three pamphlets which Doctor Hamilton translated. They appear to be possessed by a peculiar fear of hurting the feelings of either the employer or employe in some of their rulings. For instance, the doctor must maintain secrecy as to the industrial sickness he discovers; even in making out his report to the local committee he must only indicate symptoms without stating his diagnosis, although the case may be entirely evident. While he may instruct the worker in prophylaxis against disease, he is forbidden to advise him against entering these dangerous trades. A list of industrial diseases which must be reported is given but the physician may indicate only acute cases of poisoning. There are, however, many excellent provisions such as reducing the number of persons engaged in manual work as much as possible, the providing of work clothes, refectories, printing of instructions, etc. The Italians have also seen the wasteful effects of their hurry earlier in the war and are now increasing their efforts to provide adequate protection to workers.

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Industrial Hygiene at Harvard Medical School.—The Harvard Medical School is prepared to offer courses of instruction in industrial hygiene and facilities to investigate the problems of industry. This is made possible through the foresight and generosity of a group of New England manufacturers, who appreciate the importance of studying the diseases of occupation and improving the conditions of labor.

Boston and its immediate vicinity offers exceptional opportunities for work of this kind. Within a short distance are found a great variety of industries, and the school has the assurances of sympathetic coöperation through an advisory board of business men consisting of:

W. E. McKay, Massachusetts Gas Company and New England Manufacturing Company.

S. Harold Greene, Lockwood, Greene and Company.

Frank J. Hale, Saco-Lowell Shops.

The President of Harvard University has appointed a Committee on Industrial Hygiene which is organized as follows:

Dr. David L. Edsall, professor of Clinical Medicine.

Dr. Reid Hunt, professor of Pharmacology.

Dr. M. J. Rosenau (chairman), professor of Preventive Medicine and Hygiene.

Dr. C. K. Drinker, (secretary), assistant professor of Physiology.

Under present conditions instruction and research in industrial hygiene will center about three subjects, chemistry, physiology and medicine, and in these subjects new departments will be created. In addition to the new facilities so offered, courses will be developed in the pharmacological, sanitary and social phases of industry, supplementing the work of the School of Public Health. Fellowships and scholarships are available for those properly qualified.

Opportunities will be open to three separate groups:

(1) Research workers.
(2) Medical officers for large industries.
(3) Inspectors of industries.

(1) Research Workers. Those who are properly qualified to carry on original investigations may begin at any time, and the facilities and the laboratories at the Harvard Medical School, and the Massachusetts General Hospital, and the practical conditions in many large industries will be available for this purpose.

(2) Physicians who desire to prepare themselves to supervise the health of large bodies of work people may familiarize themselves with the diseases of occupation in the Industrial Clinic directed by Professor Edsall in the Massachusetts General Hospital.

(3) Through coöperation with the School of Public Health of Harvard University and the Massachusetts Institute of Technology, opportunity is afforded to those who desire to prepare themselves for the position of inspector of industrial establishments. Those who comply with the requirements will be granted a Certificate in Public Health (C. P. H.).

Women are admitted as candidates for this certificate and to all the opportunities outlined in this announcement with the exception that they will not be permitted to matriculate for the degree of Doctor of Public Health (Dr. P. H.).

In view of the war conditions alterations in the above plans may become necessary. For information apply to Dr. C. K. Drinker, Harvard Medical School, Boston, Mass.

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Dope Poisoning in Making Airplanes.—A very complete description of the dopes used in varnishing airplane surfaces as well as the results of a careful search of the literature upon the subject is given in this article. The chief poisonous dope, tetrachlorethane, has been eliminated in England. The effects of the various substitute solvents such as benzene, acetone, wood alcohol, amyl acetate and fusel oil is next described. The newness of the industry in America has not yet produced any authenticated cases of tetrachlorethane poisoning. The author fears, however, that even if danger from this be eliminated there will be opportunity for the slow, chronic effects of long continued exposure to large quantities of the other poisons used.—Alice Hamilton, *Monthly Review, U. S. Bur. of L. S.*, Feb., 1918, pp. 37–64.

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Diseases of Occupation in Great Britain, 1917.—The *Monthly Review* copies a table showing the distribution of 707 cases of occupational diseases and 100 deaths which took place, according to official reports made to the Home Office in Great Britain during the year 1917. Practically half of these were due to lead poisoning with toxic jaundice second and anthrax third.—*U. S. Bur. of L. S.*, March, 1918, p. 198.

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Production and Accidents Among Coal Miners.—During the year 1916 the coal mines of Ohio produced 34,526,552 tons of coal, or 6.9 per cent of the total bituminous coal mined in the United States. Of this amount 91.5 per cent was machine mined. The proportion produced by pick mining showed a decrease of more than 2 per cent over the previous year. At the same time motor haulage showed a marked increase as compared with animal and hand hauling. The total employes numbered 41,877. The average production for a pick miner was 659 tons and per machine runner or helper, 9,966 tons. There were reported 108 fatal accidents and 3,560 non-fatal accidents of more than seven days' duration. For these the Industrial Commission paid awards amounting to $382,620.96 not including cost of medical and hospital attention in those establishments which were self-insured. These compensated cases equaled the entire time of 2,999 men for one year.—*Mines and Quarries in Ohio*, 1916, *Industrial Commission*, Columbus, Vol. IV, No. 10.

Lead Poisoning as a Cause of Pernicious Anemia.—Byfield is certain that his patient, a linotyper, who in 1913 showed the typical signs of chronic lead poisoning and in 1917 those of pernicious anemia, represents a true transition from lead poisoning to pernicious anemia, as has been assumed by some previously, particularly in foreign literature. The patient in the end presented the typical case of so-called Addison-Biermer type of true or essential pernicious anemia and the author believes he is justified in concluding that lead was the hemolytic poison concerned.—Arthur F. Byfield, *Illinois Medical Journal*, Feb., 1918, pp. 105–107.

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Industrial Physicians to Assist in the Control of Cancer.—The American Society for the Control of Cancer, in conducting propaganda, has enlisted the aid of physicians and surgeons connected with industrial plants who come in close contact with large bodies of men and women. To assist the project in Massachusetts, Harvard University has established a service for the free diagnosis of cancer including the free examination of pathologic material removed at operation.

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An Industrial Disease Prevention Conference was held March 25, 1918, at Fitchburg, Mass., to promote greater coöperation between the medical profession and the State Board of Labor and Industries in the prevention of industrial diseases. Representatives of the State Medical Society and the State Board addressed the conference urging education of the workers and employers on matters pertaining to factory sanitation. The importance of the occupational history as an aid in diagnosis was pointed out and treating agencies urged to keep a careful record of the occupation of the patient. It is planned to hold similar conferences in every medical district of the state.

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Aid from the Medical Profession in the Prevention of Disease in War Industries.—The general medical profession can be of but little aid in preventing industrial diseases at their source, but assuming that all proper regulations have been adopted to insure the right selection and classification of workers and to prevent over-fatigue and diseases at the plants, the next step is that there shall be a prompt recognition of disease as well as over-fatigue that may occur despite these regulations. It is at this point that the aid of the medical profession begins and physicians should familiarize themselves with the new diseases, as well as the older ones, which have made their appearance in connection with the manufacture of modern munitions. The first step to be taken is one of publicity, including repeated meetings of local medical societies to rouse interest in industrial diseases generally, the preparation and distribution of brief but carefully written descriptions of industrial diseases, the inauguration in medical colleges of special courses in industrial hygiene and the prompt reporting of certain classes of cases occurring among workmen in war industries.—Alfred Stengel, M. D., *Medical Record*, April 6, 1918, p. 587.

⁂

Wood Alcohol.—Dangers in the manufacture and industrial uses of wood alcohol have again been recently investigated in New York State and an illustrated seventeen-page pamphlet prepared which summarizes the findings. This dangerous alcohol is found to be used as a solvent usually for shellac in such industries as the manufacturing of artificial flowers, pencils, picture frames, varnish removers and hats of both felt and straw types. Denatured alcohol, denatured, however, oftentimes with wood alcohol, has been substituted in the varnishing of furniture, in the manufacturing of varnish and in brewery vat varnishing. The pamphlet ends with a concise statement of conclusions and rules proposed for safeguarding workers.—*Special Bull. No. 86, N. Y. State Dept. of Labor, Div. of Ind. Hyg.*

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Industrial Physicians and Surgeons Meeting.—Coincident with the meeting of the American Medical Association in Chicago, the American Association of Industrial Physicians and Surgeons held their third annual meeting at the Congress Hotel. A large representation was present. The annual address was made by Dr. Schereschewsky, the retiring president, upon the subject of "The Industrial Physician and Surgeon in the Work of Winning the War." Papers were read by Sir James MacKenzie of London, who made a plea for greater appreciation of the general practitioner; by Irving Clark, who spoke on hospital experience abroad, among significant statements being, "The industrial surgeon makes good any place you put him because he is used to handling emergencies, and is accustomed to organizing. He fits in." Dr. Francis D. Patterson fathered a resolution calling upon the Federal Government to commission industrial surgeons. Dr. C. D. Selby spoke on "the Importance of Industrial Physicians' Work in Relation to the Medical Profession.' Dr. H. E. Mock spoke on "Reconstruction of the War-Disabled." Mr. T. B. Kidner, vocational secretary of the Invalided Soldiers Commission of Canada, stated many practical points, among them being the fact that cases of disability in returned soldiers are divided equally between medical and surgical afflictions and that of those returned to Canada thus far, only about 10 per cent have been found to need re-education. Other papers were read by Lieut.-Col. James Bordley, Jr., on "Reclaiming the Blind from War"; by Dr. F. D. Patterson on "The Employment of the Rehabilitated Soldier in Industry"; by F. W. Keough of the National Association of Manufacturers, on the "Economics of Employing the Handicapped"; by Dr. Graham Taylor on "Physical Defects"; by Major Jos. C. Bloodgood on "Conserving our Man Power"; by Dr. Otto P. Geier of the General Medical Board, Council of National Defense, on "Organization of Industrial Surgeons' Work"; and Douglas C. McMurtrie of the American Red Cross Institute for Cripples. At the meeting, Sir James MacKenzie of London, Dr. Edward Martin of Philadelphia and Dr. Wm. A. Evans, were elected honorary members of the organization. The officers elected for the ensuing year are: Lieut. Col. Harry E. Mock, president; Dr. T. R. Crowder, first vice-president; Dr. Otto P. Geier, second vice-president; Dr. Francis D. Patterson, secretary and treasurer. The Board of directors elected consists of Drs. J. W. Schereschewsky, Washington; D. B. Lowe, Akron, Ohio; E. H. Hanna, Detroit; A. W. Colcord, Clairton, Pa.; H. P. Hourigan, Buffalo; and Judson C. Fisher, New York. An excellent résumé of the meeting is to be found in the June, 1918, issue of "*Hospital Management.*"

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Furunculosis Among Machinists.—Furunculosis and wound infections are unusually prevalent among operatives of lathes and cutting and milling machines who come in contact with cutting compounds and cutting oils. Multiple abscesses, sometimes of a very severe type, and frequent wound infections have been observed among such workers. A study was made by Albaugh and Hayhurst of a number of cases, occurring in a three-months' period, among 1,365 men employed in an Ohio plant manufacturing mining machinery. The men employed in departments using oils and compounds were found to be the ones chiefly affected and all infections were usually more severe among them. There were 84.5 days lost because of furunculosis during a three-months' period, representing a wage loss to the men employed estimated at $303.40. Of the 84.5 days lost, 80.5 days were lost by employes in the two departments mentioned. The total duration of all cases of furunculosis was 557 days, 84.5 days being lost time, the remainder representing 472.5 days of impaired efficiency accompanied by the menace of spread of infection. Samples of cutting oils and compounds showed contamination with pus-forming organisms, one sample showing as many as 110,000 microörganisms per gram of oil. Experiments indicated that neither mineral oils nor cutting compounds are germicidal. At the same time they apparently have little in the war of nutrient properties for supporting bacterial life, inoculations with pus-forming organisms disappearing in them in from a few hours to a day's time. Oils and compounds apparently act as carriers of infection and apparently have also an irritating effect on the skin. New oils and compounds were found to be sterile, but were contaminated in a short time after being used by men expectorating in the machines and by the oil coming in contact with boils and pimples on the arms of operators. Chemical disinfectants, particularly the cresols, are of but doubtful value when used to disinfect oils. The oil apparently exerts some protective influence over organisms in the nature of emulsification. Prevention depends upon the education of employes in regard to expectorating into lubricants and reservoirs, the frequent cleansing of clothing and prompt dispensary care of all wounds and skin eruptions. Where oil is used more than once, heat sterilization is effective. This can be carried out by heating the oil to 140 F. for twenty to thirty minutes.

For individual machines not connected in a common oiling system, intermittent steam sterilization by steam hose or jets is suggested.—Div. Ind. Hyg. Ohio State Dept. of Health *Ohio Public Health Journal*, April, 1918, p. 145.

In connection with the above, Dr. George Thibierge, at a recent meeting of the Paris Academy of Medicine, calls attention to similar lesions abroad—"bouton d'huile" (oil button). They are frequently encountered among the same class of workers mentioned above. The lesions are found on the parts of the body directly exposed to contact with lubricants, and also on parts of the body exposed to oil-soaked clothing. The production of the oil button is favored by the present necessity in industry of using lubricants of inferior quality having irritating properties. It must be considered an occupational malady and not an industrial accident.—*Jour. A. M. A.*, April 27, 1918, p. 1247.

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Effect of the Air Hammer on the Hands of Stone Cutters.—Dr. Hamilton reports the results of her study of this subject in the stone cutting and carving industries in Indiana, Ohio, Massachusetts, Vermont and Long Island City. Among men who use the air hammer there appears very commonly a disturbance in the circulation of the hands and fingers, making them blanched, shrunken, and numb, especially in certain parts. The affliction appears to be a vascular spasm accompanied with discomfort and even pain. Between the spasms the hands and fingers become normal in appearance and usually are not a source of complaint. A so-called spastic anemia is finally set up which is very slow in disappearing—men who have given up the use of the air hammer for many years still may have their fingers turn white and numb in cold weather. Apparently the condition does not impair the skill in the fingers for ordinary interior work, but may make it impossible for a man to do outside cutting or to take up a skilled trade which exposes the hands to cold. The trouble seems to be caused by three factors—long continued muscular contraction of the fingers in holding the tool, the vibrations of the tool, and cold. It is increased by too continuous use of the air hammer, by grasping the tool too tightly, by using a worn, loose air hammer, and by cold in the working place. If these features can be eliminated, the trouble can probably be decidedly lessened.—Alice Hamilton, *Monthly Review, U. S. B.* of *L. S.*, April, 1918, p. 25.

✻

High Death-Rate Among Silicia Brick Makers.—The chief inspector of factories reports, through the British Home Office, the results of an investigation into th e manufacture of ganister or silicia rock brick in which the incidence of lung diseases showed that during eight years, among an average of not exceeding 60 workers, there occurred 18 deaths from phthisis and 8 deaths from other diseases of the lungs—a death-rate from respiratory diseases alone of 54.2 per thousand. This rate is some six times that of all males in England and Wales from similar diseases. It is estimated that there are 5,000 workers so exposed in about 100 factories. The several places in the process in which dust is inhaled have been studied and recommendations and a suggested code of regulations submitted to control the dust hazard.—Abstracted from *Monthly Review, U. S. B. of L. S.*, April, p. 292.

✻

Sickness Insurance or Sickness Prevention.—The average loss of time as a result of sickness which amounts to 6.9 working days per year, with an annual wage loss of $500,000,000 to $750,000,000, and the excessive prevalence of physical defects and disabilities recently revealed by the draft examinations, resulting in impaired efficiency and vitality should induce every branch of industry and society in general to give heed to the question of sickness prevention. The argument against sickness insurance, that it leads to malingering, and meager statistics of Germany's experience showing that the number of days lost through sickness has not decreased but increased as a result of this form of insurance are given. Recommendations are made to the effect that a national health investigating commission be appointed to determine the nature, extent and causes of sickness and physical impairment in the United States, and the working out of a practical sickness prevention program.—Sickness Insurance or Sickness Prevention? *Research Report No. 6. National Industrial Conference Board*, 1918. D. G.

STORIES FROM THE DAY'S WORK

Contributions to this section are invited.—*Editor.*

A MEDICAL QUACK.

My first insight into quackery was in 1888 when I went to Alabama, and there found a man travelling through the country, sending ahead of him an advance agent driving a nice vehicle drawn by four gray mules. The envoy pasted on the walls of various places a picture of this man and the wonderful things he could do, with the statement that he would be at a certain place at a certain time.

Finally the quack-in-chief came, presenting a good appearance, wearing good clothes, and driving a pair of gray horses. He sent for me and I went with him to see an old woman in the community who had a large tumor on the neck. She had consulted various surgeons and they were of the opinion that the carotid artery was behind this tumor. I told him it could be removed easily, whereupon he asked me if I would do the operation for him. I accepted, and he handed me $50. I saw that woman pay him $400 in cash and she gave him notes for $600. He tore these notes up and threw them in the road. I asked, "why"? He said "I will never ask them to pay the balance and I will leave this community before long."

His patients always needed "medicine" so he gave them a jug with a mixture containing sufficient *nux vomica* to make it taste bitter; $50 was the charge for one of these. In two weeks this "doctor" left with over $7,000,—more money than the doctors of that town collected in an entire year.

The other day a man dressed in the *ante-bellum* style his hat made in Philadelphia by special order, and his shoes made in Chicago by special order, appeared in Louisiana. He had a diploma issued in 1904 by the Dallas Medical College. Investigation showed that in the early part of 1904 that school was burned, and there was no record of diplomas issued. He showed me his diploma before he knew who I was. A card which he dropped had on it the name of a man who was a contractor in Los Angeles, and the diploma was issued in the name of this man. I succeeded in bringing from him the statement that he knew of 100 of these diplomas that had been sold.

Oscar W. D. Dowling, M. D.,
President, Louisiana State Board of Health.

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FOUR OF A KIND, AND A LONE JOKER.

Some years ago the mayor of a distant city called me to make a diagnosis. When I arrived, he met me at the depot and told me I had better take the next train home. The health officers (there were four) had learned that he had sent for a Chicago doctor, and, as he had done it without consulting them, had threatened to quarantine me if I visited the patient. I said I would risk it.

When the officers learned who I was, they were anxious to get even with the mayor for acting without their advice, and so had threatened the quarantine. The leading physician of the city—a particular friend of theirs—had made a diagnosis of smallpox. They were competent men, but had had little experience with this disease.

The patient, a woman, had been quarantined. The husband insisted that his wife had several times before been attacked in the same way; it was his insistence that the disease was not smallpox that had caused the mayor to send for me. I went to the quarantined house.

The case was clearly one of recurrent exfoliative dermatitis, though I said nothing about my diagnosis until we returned to the office. After a slight struggle they accepted my diagnosis, and I asked them if they wanted me to tell the mayor who was waiting up to hear from me. They did not.

The hour was late. They called up the mayor and told him they wanted to entertain me themselves for the night. They took me to the hospital, where waited the entire staff, among them the surgeon who had made the mistaken diagnosis. He was a man of brains and a royal good fellow. We had a midnight luncheon, and talked until two o'clock. Thus they made certain I would not see the mayor that night. In the morning a health officer was by my side when I visited him, and stayed with me until the train started.

To the mayor I explained that smallpox was all over the state; that he was fortunate to have health officers who would promptly quarantine all cases and enforce vaccination; that commendable precautions had been taken, and that there would be no more cases. I talked fast, and omitted mention of the patient. I told the men to terminate the quarantine, and set the woman at liberty.

Naturally, the men had felt a little revengeful for the mayor's discourtesy, but they were satisfied with the outcome as I engineered it. A more genial group I have never met, and I now count them among my friends although, until called to their city, I had never seen any of them.

Heman Spalding, M. D.,
Chief, Bureau of Medical Inspection, Chicago Health Department.

*

The Mad Rush.—On one occasion Professor Huxley was late in keeping his appointment in Belfast. Leaving the train, he hastily took a cab and shouted to the cabman, "Drive fast," and away the cab went, till the question arose in the Professor's mind whether he had told the driver where to go, so he shouted to him: "Do you know where you are going?" Whereupon the driver replied: "No Sir, I don't know where I am going, but I am driving fast." Many with whom we come in contact remind us of this incident. They are "driving fast" without knowing where they are going.

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PUBLIC HEALTH LABORATORY NOTES

Abstracts by Arthur Lederer, M. D.

New, Practical Colorimeter.—The apparatus consists of two graduated tubes one of which has a lateral tube near the bottom. This lateral tube is connected with a reservoir containing the standard comparison solution. A definite volume of the solution to be examined is placed in the sealed tube and the other tube is filled with the standard solution until the color becomes identical.—E. Moreau, *Ann. fals. 10, 235 (1917); Jour. Chem. Soc., 112, II, 418.*

⁂

Easy Method of Staining Ameba Cysts.—Cysts, which have been killed by heat or alcohol, are stained by aniline dyes more readily than are living cysts. The best stain is a saturated solution of iodine in 70 to 80 per cent alcohol; cysts are stained golden yellow with slightly darker nuclei.—S. Oi, *Taiwan Igakukai Zasshi, No. 174, 249 (1917); Japanese Med. Lit. 2, No. 66, (1917); Chem Abst., 12, 919 (1918).*

⁂

The Color and Decolorization of Water.—A suspension of iron hydrate is recommended for decolorization. It is preferable to bone black.—A. Massink, *Water 1, 78 (1917).*

⁂

The Atropin Test in the Diagnosis of Typhoid Infections.—According to Morris (*Brit. Med. Jour.* 2, 717), the normal individual or the patient ill of diseases other than typhoid infections responds to the administration of atropin with a noteworthy increase in heart rate. In typhoid patients, however, this acceleration either does not occur or occurs to a lessened degree. The authors tested 170 non-typhoid patients with the atropin reaction; 36 per cent of the number examined yielded results characteristic of typhoid. Those cases giving reactions typical of typhoid without any evidence of typhoid existence were distributed over 13 diseases. It is concluded from so high a percentage of discrepancies that the atropin reaction is without especial value in the detection of typhoid infection.—A. Friedlander and C. P. McCord, *Jour. Am. Med. Assoc., 70, 1435, (1918).*

⁂

Effect of Alkaline Glycerin on Smallpox Vaccine.—An investigation of the cause of several failures following smallpox vaccination with a virus that had previously given 100 per cent successful vaccination, led the author to suspect the deterioration of the vaccine. He finds that vaccine ground with alkaline glycerin and allowed to remain at room temperature yielded results inferior to those obtained with neutral glycerin.—J. N. Force, *Monthly Bulletin California State Board of Health,* May 1918, p. 458. (*D. G.*)

⁂

Blood Coagulometer "Biffi-Brooks."—Since the absence of importations have deprived the medical profession and scientists of the possibility of obtaining a number of instruments, it may be of interest to learn that a very satisfactory model of blood coagulometer is manufactured and offered by E. Leitz, Inc., New York, N. Y.

⁂

Canal Zone Water Supply.—The Agua Clara, Mount Hope and Miraflores purification plants have rated daily capacities of 2½, 8 and 15 million gallons respectively, the method of treatment being aeration, sedimentation, rapid sand filtration and intermittent chlorination. Conditions peculiar to the tropical climate necessitate very frequent cleaning of the different basins in the smaller plants in order to remove growths of algæ and harmless bacteria. The Miraflores plant seems to be comparatively free from this objectionable feature. The yearly average amounts of alum used at the three plants in the order named above were, 220, 163 and 179 pounds per million gallons respectively. It was found that the addition of the alum to the water prior to aeration reduced the amount of CO_2 from over 6 p.p.m. to 2 p.p.m. and increased the length of filter runs accordingly. It is claimed that "by the removal of free CO_2 in the filtered water, a bactericidal action is established which, while not permanent, serves to effect considerable reduction in the bacteria before the water is consumed." The yearly average B. coli index (number per litre) was for the raw waters about 1,000, and for tap waters about 100. Liquid chlorine was used at the two larger plants intermittently as repairs and supplies permitted. Effective bacterial reduction at the pumps by chlorination was nullified by growths in the distribution mains. Of 1,428 samples of raw, settled and tap waters, presumptive tests were confirmed in 73 per cent of the raw water samples, 57 per cent of settled water samples and 52 per cent of tap water samples. Limnological studies during the year show the presence in the raw waters of numbers of diatoms, protozoa and chlorophyceæ, other organisms not being very numerous. The necessity of floating intakes for tropical impounded water supplies to avoid disagreeable taste and odor is stressed.—*Report on the Water Supply in the Canal Zone for the Year Ending June 30, 1917,* by George C. Bunker, Physiologist. (*B. Cohen.*)

⁂

Use of Rabbits in Pneumococcus Differentiation.—Rabbits were found to be a satisfactory substitute for white mice for differentiating pneumococci types. Three times as much sputum was injected as would have been with mice. The age and size of the rabbit seemed to make little difference.—H. K. Faber, *Jour. Am. Med. Asso.: 70, 1459 (1918).*

⁂

Lacmoid in Bacteriology.—Lacmoid is prepared by dissolving 1 gram of sodium nitrite in 20 cc. distilled water and adding 20 grams resorcinol; the solution is evaporated on a water bath and the residue is heated to a temperature not exceeding 120° C. until no more ammonia is evolved. The residue is then dissolved in water, precipitated by hydrochloric acid, washed and dried. Lacmoid was substituted for litmus in the Drigalski-Conradi medium, 20 cc. of a 2 per cent alcoholic lacmoid solution being added to 2,000 cc. of the medium; the latter was then inoculated with B. coli and the Eberth bacillus. The same results were obtained as with litmus, a red coloration being produced by B. coli, while the blue color was retained in the case of the Eberth bacillus. The reaction was distinct after 24 hours. Lacmoid is preferable to litmus as an indicator because of its constant chemical composition.—Atilio A. Bado, *Anales soc. quim. Argentina, 4, 87 (1916); Chem. Abst. 12, 1065 (1918).*

⁂

Anaerobic Bacteria of War Wounds.—The methods of isolation of these bacteria were obtained by use of the new palladium asbestos apparatus devised by the authors, which as it appears to be by far the best method of growing surface cultures of anaerobes may be described in one of its forms McIntosh and Fildes' anaerobic tin. This apparatus, which is now on the market, consists of a tin some 7 inches by 5 inches with a lever-off lid. The junction between tin and lid is sealed with plasticine. A small hole is drilled in the centre of the lid and into this is fitted a small brass stop-cock such as is used for model steam engines; the joint is made tight with solder. Over the thread of the tap on the under side of the lid is fitted a small brass bracket cut from brass sheet. This bracket carries a capsule of fine brass gauze, containing some 0.25 grm. of fine asbestos wool impregnated with 10 per cent palladium chloride. The cultures are placed in the tin and the gauze is heated in the Bunsen and the lid fixed rapidly to the tin. Hydrogen is passed in which, combining with the oxygen under the influence of the palladium creates a negative pressure, thus sucking in more hydrogen. The action continues till no more oxygen is left, which takes about fifteen minutes. Surface growths of such difficult organisms as tetanus, malignant œdema and botulinus can be obtained with ease with the apparatus.—J. McIntosh and P. Fildes, *Medical Research Committee, Report Series, No. 12.* (*D. G.*)

⁂

The Value of the Wassermann Reaction.—The value of the reaction in diagnosing undoubted syphilis is shown by the fact that the reaction is positive in practically 100 per cent of the cases of florid syphilis. In active tertiary syphilis of the skin and bones the reaction is positive in about 94 per cent of the cases. As a means of corroborating syphilitic infection, the Wassermann test is at least 90 per cent dependable, as shown in a series of positive reactions in which 90 per cent could be accounted for by syphilitic changes in the aorta alone. The value of a negative reaction has been studied and its reliability confirmed by the negative reactions obtained in nonsyphilitic affections of the skin.—John H. Larkin, I. J. Levy and John A. Fordyce, *Jour. Am. Med. Assoc., 70, 1589 (1918).*

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Improved Technic for Cultivating the Streptococcus.—The characteristic chains appear earlier and more certainly when Sacquepee's sodium albumin is added to ordinary bouillon. This is prepared by mixing white of egg with three times its volume of distilled water. Five cc. of a 10 per cent sodium hydrate solution is added to 1,000 cc. of the mixture. Distribute in tubes and sterilize at 110° C. for 20 seconds. One part mixed with four parts of plain bouillon is put up in tubes. About 0.5 cc. of the fluid is inoculated with 3 or 5 platinum loops of pus or serous fluid. Incubate and examine under the microscope after three to six hours. In 90 per cent of the cases a diagnosis can be made after six hours.—L. Ramond and L. Postina, *Bull. de la Soc. Med. des Hopitaux, Paris, 42, 142 (1918).*

*

Identification of B. Tetani by Serological Reactions.—One of the great obstacles to be overcome in any systematic study of the B. tetani was that the methods hitherto employed for isolating it have proved inadequate for dealing with numbers of strains of the organism. The ideal medium for the isolation of the B. Tetani would be a fluid medium which favoured the growth of that organism whilst restraining the growth of other anaerobic bacteria commonly found in wounds. From numerous experiments the author suggests the following medium: To one pound of chopped meat, a litre of water is added and the mixture is then boiled for thirty minutes. It is then cooled to 45° C. and the reaction adjusted so that it is slightly alkaline to litmus. It is then trypsinized as for the preparation of Douglas' broth and then incubated in an open vessel for five days at 37° C. The putrid product is then filtered through paper and sodium formate is added up to 1 per cent. The reaction is then adjusted to the neutral point for phenol-phthalein and the fluid filtered through a Berkefeld and a Doulton filter in series and is then stored under paraffin in a sterile flask. Before use, each 10 cc. is enriched by the addition of a small piece of fresh sterile rabbit-kidney. Working with such a medium the writer examined a number of different strains and tested their agglutination reactions. As a result of these researches he considers that there are at least three serological types of the B. tetani, and further that in cases of tetanus among the wounded in this country the causal bacilli do not appear to correspond serologically with the type commonly employed for the preparation of antitoxin. On the other hand in some strains of the B. tetani isolated from wounds in men who showed no evidence of tetanus, the predominant type of organism corresponds to the type used for antitoxin formation.—Capt. W. J. Tullock, *Jour. Royal Army Med. Corps, xxix, No. 6.*

(*D. G.*)

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A Simplified Endo Agar.—The composition of the medium is as follows:

Distilled water, 1,000 cc.
Peptone (Difco), 10 grams.
Dipotassium phosphate, 2 to 5 grams.
Agar, 15 to 30 grams.

Boil until dissolved. Do not adjust reaction. Place in flasks and sterilize in autoclave. Previous to use add the following ingredients to each 100 cc. of medium:

20 per cent lactose solution, 1 gram or 5 cc.
10 per cent alcoh. sol. basic fuchsin, 0.5 cc.
Freshly prepared 10 per cent sodium sulphite sol., 2.5 cc.

Members of the colon-typhoid group are quite easily differentiated on this medium. B. coli is deep red with a metallic luster, B. aerogenes is lighter red with no metallic luster, while B. typhosus and B. paratyphosus are transparent, colorless, or slightly amber in appearance.—Max Levine, *Proc. Soc. Am. Bact., Dec. 1918.*

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Quantitative Agglutinin Fluctuations After U. S. Army Triple Typhoid Vaccination.—The reactions after the triple vaccination are negligible when compared with the results derived. Specific agglutinins are produced for each of the three organisms used. The para-B responds comparatively sluggish. The specific agglutinins do not rise to equal heights, but very noticeably in individuals. There is no relation between local and systemic reaction and agglutinin production.—E. A. Fennel, *Proc. Soc. Am. Bact., Dec. 1918.*

A Study of the Antiseptic Properties of Certain Organic Compounds.—The paper is the result of a study of the inhibitive effect of anilin and of the triphenyl-methane dyes on certain bacteria. The higher the concentration of peptone in the medium the lower the effective concentration of the dye. The increase in the number of alkyl radicles increases the antiseptic power. Methyl green proved to be an exception to this rule. The antiseptic power is enhanced to a greater extent by an ethyl than a methyl group. The simple anilin derivatives, as well as the dyes, are more toxic for the Gram-positive than the Gram-negative bacteria.—I. J. Kligler, *Proc. Soc. Am. Bact., Dec. 1918.*

✻

Recovering Dysentery Bacilli from Stools.—The experience of the authors in the eastern Mediterranean and in Egypt in 1915 and 1916 showed that the chance of recovering dysentery bacilli from the stools was, after the first few days of the disease, a small one. The technic and percentage of positive results are given. The chance of recovering dysentery bacilli diminishes rapidly after the first few days. This appeared to be the case whether the stools remained characteristically dysenteric or not. This places a serious limit on the value of a bacteriologic examination.—C. J. Martin and F. E. Williams, *Brit. Med. Jour., 1, No. 2990, p. 447 (1918).*

✻

Simple Methods for Prolonging the Viability of Meningococcus Cultures.—The uncertainty of maintaining cultures on blood agar, starch agar, and sheep serum glucose agar slants led to an attempt to find a simple, stable medium in which the organisms might be kept alive with less difficulty. This has been accomplished by the use of various deep mediums, especially beef brain. The author was led to test the viability of meningococci in sterile brain by the apparent affinity of these organisms for nervous tissue. In addition to deep brain, a deep blood medium was also used. To obtain cultures for serologic work, it is preferable to subplant from the brain medium on to blood agar slants, incubate twenty-four hours, and subplant from these slants to fresh blood agar to secure suspensions of organisms free from brain. The brain medium is easier to prepare than the blood medium. The work has as yet not been concluded. Brain cultures remain alive for many days at lower temperatures but the viability is higher at 37° C. —Dolores E. Bradley, *Jour. Am. Med. Assoc., 70, 1816 (1918).*

✻

Reduced Eosin as A Reagent.—Reduced eosin in strongly alkaline medium is regarded as preferable to Goldemberg's reagent containing reduced eosin in very slightly alkaline solution insofar as its use as a reagent for investigation of blood spots is concerned; a pronounced greenish fluorescence (similar to that of fluorescein) is obtained with a strongly alkaline medium and thus greatly increases the sensitiveness of the reagent, since the fluorescence is much more apparent than the coloration in dilute solutions. In this manner it was possible to detect 0.00025 cc. of blood in 1 liter of water.—Luciano P. J. Palet and Amancio Fernandez, *Anales socsquim. Argentina, 5, 119 (1917); Chem. Abst., 12, 1201 (1918).*

✻

Differentiation of Typhoid and Paratyphoid.—Typhoid and paratyphoid A and B can be differentiated by means of a medium consisting of a 3 per cent agar containing 1 per cent of inositol and 1 per cent dextrin, using litmus as an indicator. The dextrin must be one of the lower dextrins. The typhoid ferments the dextrin, with acid formation in the butt of the tube, decolorizing entirely in twenty-four hours with a violet slant. Paratyphoid A does not ferment either dextrin or inositol and so the butt and slant of tube both remain violet in color. Paratyphoid B ferments inositol with gas formation and so paratyphoid B decolorizes the butt of the tube with the formation of gas bubbles, while the slant remains violet in color.—Florence Hulton-Frankel and Katherine MacDonald, *Proc. Soc. Exp. Biol. Med., 15, 31 (1917); Chem. Abst., 12, 1202 (1918).*

✻

Water Analysis in the Field.—An application of Leighton's tablet methods (U. S. Geol. Surv. W. S. Paper 151) to the proximate analysis of waters. Some modifications have been introduced.—G. W. Heise and A. S. Behrman, *Philippine Jour. Sci., 13 A. l.*

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HEALTH AND WAR.

Irving Fisher,
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MANY people are imagining that when this war is won the great world questions will be settled. We know, however, from the experience of other wars that the coming of peace will be but the beginning of great questions.

Among these questions I believe that two of the most important will be the labor question and the health question.

Labor has been asked to support this war and has supported it. And at the end of the war labor will say: "We have done this for our country; what is our country going to do for us?"

I understand that in England promises have been made to labor which, some of the friends of labor say, it will be practically impossible to keep. But they have been made in response to this psychological attitude. There will be new and acute labor problems due to the readjustment necessary when the men from the trenches come back.

And then there is this great problem of health. The war is a means of destroying human life; and therefore in its reaction will probably be the greatest stimulus to life conservation which we have ever experienced. Many a town has never had good fire fighting apparatus until it has had a great fire. We did not make much progress in safety at sea until we had the *Titanic* disaster. And so we see that the loss of human life which this war has brought has produced a powerful stimulus toward saving human life.

The labor problem and the health problem really fit one into the other. And we can answer labor's question: "What will the country do for us?" very largely by giving health to labor. The greatest asset of the laboring man is his health.

Already the armies and the navies of the belligerent nations have been making use of the very best medical talent available to keep the soldier in health; to prevent his getting typhus; to safeguard him from other epidemics; to provide him with safe drinking water. There have been great surgeons trying to repair broken lives, and there have been great discoverers in medicine drafted across the water to help in new methods. At the end of this war we shall have new medical knowledge which we would not otherwise have had.

The war has led to a restudy of the alcohol problem. All of the belligerent nations have taken some steps toward the reduction if not the elimination of this physiological poison in order to save the men from drunkenness, from the inefficiency that comes from partial intoxication, and to save them from the venereal diseases that come from lack of self-control when under the influence of alcohol.

Then there has been a new interest in individual health. There has been a great impulse to military and physical training all over the world. But we shall fall far short of our duty in this matter if we stop here merely. We should, during the war, certainly after the war, take the lesson of the war to heart, and in systematic fashion try to conserve human life.

We find that about one man out of three, medically examined, is rejected. Now that we find these young men between the ages of twenty-one and thirty-one, showing what to most people are startling defects, we ought to take the lesson.

In the first place in this country we ought to establish a universal system of vital statistics. We are the one great civilized nation that does not have a system of bookkeeping of national health. We cannot expect much vital economy until we have vital bookkeeping, any more than we can expect much money economy if we do not keep cash accounts. When I was first interested in this subject only one-third of the population of the United States kept records of death and even today only two-thirds keep such records.

The fact that so few people realize that this deficiency exists is a commentary on our low health ideals. I have sometimes wondered what might have happened if this fact were so well known that slackers between the ages of twenty-one and thirty-one, wishing to get out of the draft, had stoutly denied that they were within the draft age. What would the government have done about it? How could the government prove the age when there are no records?

To illustrate our indifference on this subject a story is told by Dr. Hurty, health officer of Indiana, of a young girl who was to get a fortune when she was nineteen. On her nineteenth birthday she came to her father and said she wanted to take possession. He said she was only seventeen. The girl claimed she was nineteen. There was no family Bible, there were no other records. For a time it looked as though no means would be found for settling the dispute. Finally the father said, "I know how to settle it. I remember the day you were born, there was a calf born and I have a record of that." We keep our records where our interests lie.

When the hookworm commission went south to try to eradicate the hookworm disease the southern communities felt insulted. They had no records, and did not know or care anything about hookworm disease. But when it was revealed that in some cases half of the community had hookworm disease they were very glad to have this Rockefeller Commission down to help eradicate it.

The nation that has made the greatest progress during the last century in life prolongation and whose progress has been distributed almost evenly from infancy to old age is Sweden where vital statistics have been kept the longest, 150 years. Consequently Sweden has watched what has been happening to each disease; has cast about for remedies when remedies were necessary. And the Swedish people have reaped their reward; whereas in this country the expectation of life at middle age is less today than it used to be. In this respect this country is almost unique. The other countries show, as Sweden does, only in less degree, progress all along the line.

Along with keeping the books of health we ought to adopt health measures. We ought to establish a national department of health as one of the consequences of this war. The movement for a national department of health has received a great stimulus in England where after three years of experience with war people are becoming alarmed. They are making investigations. They are finding that their negligence has been extremely costly. They have examined the conditions of women in munition factories and have found the fatigue of long hours and dangerous conditions are really impairing the womanhood of Great Britain.

The greatest stimulus to health conservation would be, I believe, health insurance. We ought to establish health insurance throughout the nation, preferably by national action if that be possible, but as it probably is not, then by state action. Already nine states have commissions at work on this subject. We are the one great industrial nation that does not have health insurance, and when we secure it, we shall have, I believe, what is one of the necessaries, or at any rate, one of the great engines for an efficient democracy.

There is another lesson which I hope the war may help teach, and that is that in order that labor shall be contented we must understand the psychology of the workingman. We must satisfy his great fundamental human instincts. I believe there is a field for what might be called industrial psychiatry. Recently I have discovered that a number of other people have been working along the same line and have reached substantially the same conclusions. Among these is at least one practical employer of labor, Robert B. Wolf, who has shown, in the wood pulp industry, that it is possible to make the work itself interesting to the laboring man. I think that if employers would join Wolf and the few other employers who have gone into this line, studying the psychology as well as the physiology of labor, and try to adapt conditions of work to the needs and yearnings of labor, labor discontent will be diminished far more than by any other method I know of.

As I see it, any human life in order to be a successful human life, must satisfy six or seven of the great fundamental human instincts. In my classes I have been enumerating them as follows: First, there is the instinct of self-preservation, or making a living. Undoubtedly that is the most fundamental thing. But there is also the instinct of self-expression, or the instinct of workmanship; there is the instinct of self-respect and respect for others; there are the instinct of self-sacrifice or heroism; the instinct of love, or the home-making instinct; the instinct of loyalty; and possibly, whether it is innate or not I do not know, the instinct of worship.

In order that the laboring man may live his life, he must satisfy something more than the instinct of self-preservation. His life cannot amount to much if it merely consists in keeping body and soul together. And yet, with strange blindness, the employer assumes that the only thing his employee is, or can be, interested in is his wages.

Now, what Robert B. Wolf did was to restore, in the first place, the instinct of workmanship, which has been subtly abstracted from industrial life through specialization of work and division of labor. A laboring man sees his work sweep by him, a peg in a shoe, a bolt in an automobile, and since he is not able to visualize his part in the product his work ceases to be interesting and becomes drudgery. He wants to shorten his hours; and the employer, whose work is interesting, whose work is his life, cannot understand why the employee is always trying to shirk, whereas he himself is willing to work twelve or sixteen hours a day. The reason is that in one case the instinct of workmanship is satisfied and in the other cases it is not. Wolf's scheme included a system of charts whereby men could record by a series of curves just what was happening at each stage of the process.

Eight years ago when Wolf went into this plant they were making, if I remember correctly, with a certain equipment 100 tons of the worst wood pulp in the country. Today, with the same equipment, they are making 200 tons of the best, and the transformation has been due to giving these men a record of their work and getting them interested in bettering this record. Meanwhile, wages have risen 40 per cent; there have been no strikes; the men are loyal to the organization; and altogether the industrial problem has been largely solved. All day these men trace with a lead pencil their work. Their own part in making that wood pulp is that little picture or graph. And they are just as much interested in making that picture every day as an artist is in painting a new picture. It is theirs. They get credit for it in the eyes of their fellows and in the eyes of their boss.

There is more in the system, because Wolf has tried to satisfy also the other great natural instincts, the instinct of self-respect and respect for others, the instinct of loyalty; making them feel as though they were human beings—his brothers, instead of a lower order of human beings interested only in their pay envelopes.

Would you try to limit the instinct of a soldier merely to his pay envelope? Would you try to make a soldier go over the top by bribing him? Suppose President Wilson had said to General Pershing: "Now, Pershing, I want to be sure you are always on the job, and not skimping it. I have developed a system by which your wages will go up or down according to your victories."

What do you suppose Pershing would have said? He would have said: "Mr. President, what do you take me for? Of course I must live. But I am not primarily interested, or only interested, in my pay envelope. The motives which are sending me to France are loyalty to my country, heroism, the desire to sacrifice myself for an ideal, and, may be, to win some glory. Idealistic motives spur me and keep me at work."

And now we are taking men out of the factory and sending them into the trenches, when the only stimulus we have played upon in the factory has been the pay envelope; and yet these same dormant higher motives are there and will operate to make good soldiers. They could be enlisted to make good workmen. I hope that this may be one of the lessons of the war. If it is not, we shall have acute labor discontent when the men return from their great adventures abroad to the humdrum of the workshop.

After this war we must apply science to industry, in a way to make industry more wholesome and healthy; which means not only better sanitation and ventilation, not only how to make the workman keep his bodily functions going properly, but how he may obtain mental health so that he may live, as Professor Alfred Marshall says, a complete all-around life. And if we are to say that the world owes every man a living we should mean not only that it owes him wages, but also that it owes him the full expression of the fundamental instincts of a human being.

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Sewage Disposal on Dairy Farms.—The United States Department of Agriculture through the Bureau of Animal Industry has issued a special letter to health officers in which the proper disposal of sewage on dairy farms is emphasized. To health officers, this is obviously important, not only for the protection of the public health, but also for the safety of the dairyman's family. Privies on dairy farms should be fly-proof, and provided with a watertight receptacle for the excreta. The excreta should be removed frequently and buried at least two feet deep, where it cannot contaminate the water supply. Attention is called to Bulletins 68 and 89 of the United States Public Health Service for information pertaining to the proper construction of sanitary privies.

(*M. P. H.*)

Shorter Isolation Periods in Infectious Diseases.—As a result of an investigation of secondary cases in infectious diseases the author (H. W. Hill) is of the opinion that for whooping cough an isolation period of four weeks would be sufficient. In German measles one week is all-sufficient. In mumps three weeks is ample and indeed too long. He would release cases of mumps having a normal temperature, no sore throat or nose bleed, no swelling of glands or orchitis, in two weeks, or even less in light cases. In scarlet fever no case should be released short of five weeks, and only then if everything, temperature, ears, nose, glands, etc., have been absolutely normal for at least one week. In epidemic cerebro-spinal meningitis two weeks may be sufficient, but the smear method of release, i.e. three consecutive negative smears, 24 hours apart, from nose and throat, is preferable. —*Western Medical News*, 1918, p. 76. (*D.G.*)

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Annual Meeting, A. P. H. A., Chicago, Oct. 14-17.
Come, and Bring a New Member.

THE RAT AND INFANTILE PARALYSIS—A THEORY.

MARK W. RICHARDSON, M. D.,
Boston, Mass.

Read before the Association of American Physicians, May 7, 1918.

SECOND COMMUNICATION (1).

IN a paper published in the *Boston Medical and Surgical Journal* for September, 1916, I discussed the epidemiology of infantile paralysis from two standpoints, presenting, in the first instance, evidence against human contact, direct or indirect, as being the determining factor in the spread of this disease, and, in the second place, suggesting that the epidemiological facts could be better harmonized if one assumed an antecedent and underlying infection of rodents, and the mediation of the flea.

I have been told that my argument against the rôle of human contact was much stronger than that in favor of the rat. The justice of this criticism I acknowledge freely.

Manifestly, the truth or falsity of the rat theory must, in the end, be proved by laboratory investigations which are still almost entirely lacking. Is the rat susceptible to the virus of infantile paralysis? As used by Flexner and others the virus has not produced characteristic disease in rats. On the other hand, as used by Rosenow and his co-workers, almost all the laboratory animals have been found susceptible to infection. If guinea-pigs can be infected easily, it is highly probable that the same will be found true of rats. Personally, I have not been able to undertake this laboratory work.

My purpose in this present paper is to strengthen, by additional epidemiological data alone, my hypothesis that a rodent epizootic must and does precede human infantile paralysis.

Before taking up the question of rodents, however, and their possible relation to the disease, I will offer some further evidence that, in the transfer of infantile paralysis, human beings are not themselves of importance, directly or indirectly, as far as infectious secretions or excretions are concerned, though; as we shall see later, healthy third persons, as carriers of *infected fleas* may be of very great importance. This new evidence has been furnished in great part by Prof. Charles T. Brues (2) who, as consulting entomologist, investigated the New York City epidemic of 1916, and who, under urban, and, therefore, as generally considered unfavorable conditions, was, nevertheless, able to develop epidemiological facts of apparently great importance. For instance, whoever has seen a city slum street in summer-time cannot imagine more intimate personal contact than is enjoyed by the tenement children playing in the crowded, hot, dusty thoroughfare, and yet it appeared that cases of infantile paralysis might be numerous in the tenements on one side of a street, with no cases whatever in similar houses opposite. (See chart No. I.)

The contagium appeared, therefore, to be quite sharply localized in the quadrangle formed by the tenements bounding a city block, and did not

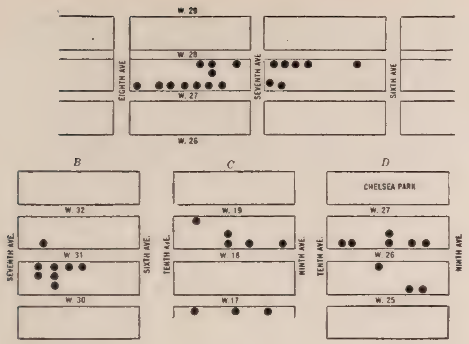


Chart 1. Four groups of cases of poliomyelitis on the west side of Manhattan, illustrating the typical group of cases. Each dot represents one case; those along the street show the approximate position of the house and those away from the street, additional cases in the same house. N. Y. City Report. 1916.

travel across the street in spite of all the human migrations and opportunities for direct and indirect contact. If human carriers could not carry the infection across the street, then it is equally improbable that the cases in the same block were transferred one to the other by human agency. On the other hand the unrestricted migration of infected rats over the back yards enclosed by such tenement quadrangles would explain quite adequately the sharp localization of the human cases. A somewhat parallel phenomenon has been seen in plague conditions in India, where people of different castes never associate with each other. In spite of this absence of human contact, plague spreads from caste to caste. The explanation is, in the end, simple: although personal association is forbidden, the houses, fronting oftentimes on different streets, have adjacent back yards over which rats travel freely.

In this connection it may be noted that in India the distribution of rats has been found to be very irregular. The general character of a building is no index of its rat population. In a considerable collection of old ramshackle buildings, perhaps only one or two will be found to be rat-infested. On the other hand, buildings apparently well-built and well-kept, and occupied by the well-to-do class, are not infrequently overrun with rats.

A study of secondary cases by Professor Brues showed, furthermore, that a large percentage occurred in other families of the same building with little or no personal contact, whereas in scarlet fever and diphtheria most of the secondary cases occurred in the same family. (See table No. I.)

Table I.

Localization of Secondary Cases.

	Cases in same family.	Cases in same house but different family.
Poliomyelitis	335 or 56%	257 or 43%
Scarlet Fever	198 or 86%	31 or 13%
Diphtheria	73 or 78%	20 or 21%

I shall have occasion to refer again to Professor Brues's work, but it may be said here that conditions, as he found them, argued strongly against human contagiousness, and suggested as strongly an underlying animal reservoir of infection with an intermediary insect host. If the latter surmise be true then no combination satisfies the world-wide and the peculiar seasonal incidence of infantile paralysis but the rat and the flea. Such a theory would not, of course, exclude the occasional involvement of other rodents or even other animals not of the rodent family.

Having brought the rat and flea under strong suspicion, it was but natural that a comparative study of infantile paralysis and bubonic plague should next be made, and to me, at least, the points of resemblance of these two diseases are quite remarkable.

That the rat and the disease are in some way associated has been known many centuries, witness the old coin with the image of Apollo, the god of pestilence, upon it and at the god's feet a rat. Nevertheless, it was but a few years ago that the contagiousness of bubonic plague was strongly urged even though, as in infantile paralysis, the spread of the disease in hospitals was practically unknown. Indeed, it was frequently remarked that, during a plague epidemic, the safest place was the plague hospital. Concerning infantile paralysis, Health Commissioner Emerson made a quite similar observation, that apparently the safest place in New York for a child was a children's institution, where the disease was rare, and, if introduced, did not spread. Ninety-five institutions held 29,000 children, but only 12 cases involving 6 institutions occurred.

Note, furthermore, is to be made of the fact that during an outbreak of poliomyelitis in Burlington, Vt., an orphan asylum in the middle of the infected district had no cases. The failure of infantile paralysis to spread in hospitals, schools, and institutions has its complete parallel in bubonic plague. A case of the latter disease imported into an uninfected locality never spreads. (That is to say, unless infected fleas are imported at the same time. The rare instances in which infantile paralysis is seen in hospitals or children's institutions may well be due either to the limited occurrence of rodents in such institutions, or to the importation of infected fleas from the outside either by visitors, new inmates, or institutional employees.) Stephens (3) in Australia noted that whereas cases of infantile paralysis did not spread in the general hospital wards this could not be said of the out-patient departments in which occurred marked and indiscriminate mingling of all sorts of people. It is not difficult to imagine the introduction into such out-door departments of infected fleas or other insects.

In this connection, it is interesting to quote from the New York City Report of 1916 that "no attendant, physician, nurse or domestic, and no patient admitted to any of the hospitals throughout the state, for other cause than poliomyelitis, during the epidemic, contracted poliomyelitis. . . . One of the field nurses of the department engaged in daily house-to-house visits among the families where active cases were isolated, developed poliomyelitis in a severe paralytic form." The fact that the hospital personnel in infantile paralysis does not acquire infection is an experience so nearly universal that the rare exceptions serve only to prove the rule. In other so-called contagious diseases such as diphtheria, scarlet fever, and even typhoid fever, ward infection of nurses and other attendants is very common. It can be said, therefore, of infantile paralysis with almost absolute certainty that the virus, as present in such hospital wards, must be in an inactive state. The same can be said also of the virus as used by laboratory workers, for no case has come to my notice in all the literature in which a laboratory worker has acquired infantile paralysis in the course of his investigations, even though, as in one instance, the syringe broke and virus was sprayed into the face of the investigator. From the New York Report, however, we note that a nurse engaged in a house-to-house visiting of cases acquired the disease and other similar instances in doctors and nurses are on record. In other words, people who visit infected districts, be they children or adults, doctors, nurses, or laymen, meet the virus apparently in a very active state. This sharply activating influence not seen in hospitals, schools, or institutions, but present in the homes and quite definitely limited by seasonal influences lies almost certainly in some insect most probably the flea. Whether or not a secondary cycle of development, limited in time, takes place in the insect can be determined only by future investigations. There is considerable evidence, however, that the period of infectivity in any particular locality is quite sharply limited.

Bubonic plague in human beings is always preceded by rat plague, and, in nearly all, *though not all*, epidemics sick and dead rats are in evidence and give the alarm. In Liverpool, for instance, three cases of human plague occurred, but no plague rat was ever found though diligent search was made. Furthermore, for every plague rat that is seen, hundreds die unseen. The fact, therefore, that sick or dead rats are rarely seen during epidemics of infantile paralysis is no evidence that rodent infection does not occur.

Is there any evidence that during epidemics of infantile paralysis rats are sick or paralyzed? Not much, but enough to suggest that we can find much more evidence if we look for it in a proper manner.

In 1909, my friend, Dr. J. L. Goodale, moved an old barn on his summer estate. Shortly after this, one of his sons and several other children of the neighborhood had infantile paralysis. At this time, Dr. Goodale on several occasions saw in his back yard rats, paralyzed in their hind-legs and able to move with difficulty. At the same time a cat became paralyzed on a neighboring estate.

In 1916, Mr. E. H. Williams, sent by me to investigate an epidemic of infantile paralysis in a certain New England town, saw, on the opposite bank of a small river running through the town, a rat hardly able to get over the rocks because apparently of paralysis of the hind-legs.

Dr. W. H. Coon, in 1916, investigating for me infantile paralysis in a nearby town, found one case in which a child, a few days before infantile paralysis, played with a dead rat.

Dr. John Hitchcock tells me of a boy who, on waking in the morning, found a dead rat in his bed. Ten days later he came down with infantile paralysis.

Dr. John A. Ceconi, medical inspector for the Boston Board of Health, noted that in 1916 certain cases were coincident with excavating work on nearby streets and with the appearance of an unusual number of rodents. Ceconi further observed that five cases, grouped, four in one house and one in another next door, appeared after children from each household had played with a dead rat. Similar rat stories are, of course, common in plague epidemics. This latter group is especially interesting and important from several points of view. In the first place, the neighborhood had been free from infantile paralysis for six years at least. In the second place, there were no other cases in 1916 for many blocks around. The disease was, therefore, very sharply localized in the families of two adjoining houses. The parallelism with the bubonic plague lies in the fact that the children played with a dead rat, and secondly that, in bubonic plague, dead rats are much more apt to be found in those localities in which multiple human cases occur in a family or in a house.

EPIDEMIC DISEASE IN RABBITS.

Very recently I have learned that rabbits, more especially of the cottontail variety, are subject to periodic epidemic disease. The exact nature of this disease I have been unable to learn. The epidemics are said to occur at periods of six to ten years and the mortality is very high. The last epidemic occurred in 1916, the year when poliomyelitis was at its worst in the eastern United States. In this connection, it is interesting to note that the previous severe epidemic of infantile paralysis in Massachusetts was in 1910, an interval of six years. In Sweden, two large epidemics were separated by six years, 1905–1911.

In Australia, Altman (4) noted that infantile paralysis coincided in time with a public drive for the killing of rabbits with phosphorus. The point is, of course, obvious. Rodents dead from whatever cause mean the presence of a host of loose and hungry fleas. If these fleas harbor disease-producing organisms, they may transfer them to their human victims.

In a certain Massachusetts town in 1916 the only case of infantile paralysis to occur was in a young girl who lived 200 feet from a house in which a rabbit became paralyzed and died.

PANDEMIC SPREAD OF BOTH DISEASES.

Up to 1890, bubonic plague had been restricted to certain well-defined areas of Asia, but during the last twenty-five years, this disease has spread over the whole world. Within the same period of time, infantile paralysis, which previously had been noted in single small epidemics, has become worldwide in its distribution with outbreaks much more numerous and of much larger size. (See charts No. 2 and No. 3.)

RELATION TO GRAIN TRAFFIC, GRIST MILLS, ETC.

This recent spread of plague I would ascribe to the marked increase in the world traffic in grain, for no fact is better established than the intimate relation of bubonic plague to the grain business. How about infantile paralysis? Wickman mentions three instances in which a localized outbreak began apparently at "the mill." The reason for this, in Wickman's opinion,

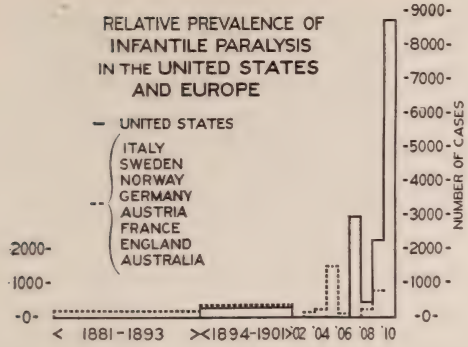


Chart 2. From Report of Mass. State Board of Health. 1910.

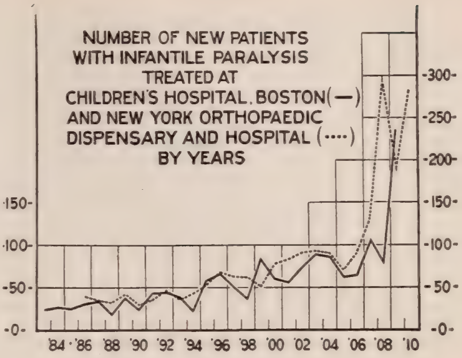


Chart 3. From Report of Mass. State Board of Health. 1910.

was that the mill was the place where neighbors came most into personal contact. The mill, however, is manifestly the place where human beings may be exposed to a maximum of rat and flea influence.

Conway (5) at Hornellsville, N. Y., thought the outbreak due possibly to cat infection. Nearly all his cases, however, were connected directly or indirectly with a grain mill.

The epidemic in 1914 at Barton, Vt., began "near the railroad station and rather near the grist mills." The association of infantile paralysis with the railroads has been very generally noted. Grain warehouses and elevators are nearly always on the railroads. Plague follows the railroad and other routes of transportation. Shidler tells of nine young adults who belonged to a *threshing crew* and acquired infantile paralysis at the same time.

In bubonic plague the relation of the cases to grain and other food supplies is marked. In the New York epidemic of 1916, Brues noted a quite similar propinquity of cases to bakeries, meat shops, stables, etc.

Rôle of Healthy Third Persons in the Epidemic Spread of Infantile Paralysis.

Pim called attention in an English epidemic of infantile paralysis to the fact that the fathers of several cases worked together in a meat shop though their abodes were far apart. Stephens (*loc. cit.*) says that the fathers of two children worked side by side. The inference is that these adults carried infected fleas home to their children. In bubonic plague infected workshops, even cotton mills have been primary foci of the disease. In Massachusetts in a certain large cotton mill, two young girls alone from a large mill population had infantile paralysis. They lived in sections widely separated but, before their regular employment, they were associated together in cleaning out the general offices of the mill which were directly over a large river, the banks of which were infested with rats. The rôle of third persons in the spread of infantile paralysis may consist simply in the transfer over considerable distances of infected fleas, which fleas may infect human individuals directly, or may set up a preliminary rodent infection. Such transfer is not uncommon in bubonic plague and in infantile paralysis would offer an explanation at least as good as infected secretions of the mouth and nose in such third persons.

POSSIBLE RÔLE OF CATS, DOGS, AND OTHER DOMESTIC ANIMALS AS HEALTHY CARRIERS OF INFECTED FLEAS.

The fact that infantile paralysis occasionally invaded the homes of the well-to-do has been used as an argument against rodent infection as preliminary to human cases. It is, however, well known that rats may be present in localities where they would least be expected. Furthermore, pet animals might perfectly well carry to the children infected fleas. In bubonic plague it has been found that although the rat flea prefers its natural host, it can, in the absence of such natural host, be found on practically all domestic animals. Furthermore, the human flea, *Pulex irritans*, has been found upon rats, and can, on occasion, transfer bubonic plague from animal to animal.

TRANSFER OF INFECTED FLEAS IN OLD CLOTHES, JUNK, AND MERCHANDISE OF VARIOUS KINDS.

Bubonic plague has been carried from one locality to another by fleas harbored in the clothes of a person who has died of the disease. In the old clothes business, therefore, as well as that dealing with waste material in general, it is highly probable that the exchange of fleas between different localities is very common. When we consider, moreover, the manner in which furniture and other household material is packed in burlap and excelsior we must realize how common must be the choice of such localities by rats for the making of nests. In the transfer of such articles from place to place, it might well be that the rats themselves were not transported, but their nests, with the fleas in them, would be carried to a new locality with consequent exposure of local individuals to the bites of very hungry fleas. Stephens (*loc. cit.*) mentions such a possible method of infection with infantile paralysis in a girl who lived far from the ordinary centers of habitation, and in whom the possibility of personal contact seemed to be absolutely excluded. This patient, however, had recently received a package of drapery from an infected district in Melbourne. Stephens makes the specific suggestion in this case that infected fleas might have been transported in this package of drapery. When one considers the geographical relations of New York City in 1916 to the various surrounding communities in Long Island and in New Jersey, not to speak even of Philadelphia or other more distant points, this possible rôle of flea-infected merchandise seems worthy certainly of attention. Kerley (6) in 1916 followed up several small outbreaks of infantile paralysis which occurred apparently through families which had moved from New York to more or less distant points. In almost all instances the local cases could be explained only by the mediation of "innocent third persons." The possible introduction of infected fleas with the household effects of the new-comers was not, of course, thought of.

SUMMER DISTRIBUTION OF INFANTILE PARALYSIS.

This is well shown by chart No. 4 taken from a report of the Massachusetts State Board of Health. When we compare this with the seasonal abundance of the cat flea (7) as shown by chart No. 5 there certainly appears a striking parallelism. The winter persistence of small numbers of fleas would explain the occasional winter cases of infantile paralysis, and winter epidemics would occur when, through unusual conditions, fleas persisted in more considerable numbers. In bubonic plague, the human curves and the flea curves are nearly coincident. (See chart No. 6.) It will be noted that human cases do not occur until the flea level has reached a certain height and that the human cases do not persist after the flea level has dropped beyond a certain point. In San Francisco, Blue found plague in the rats for months after the last human case had occurred.

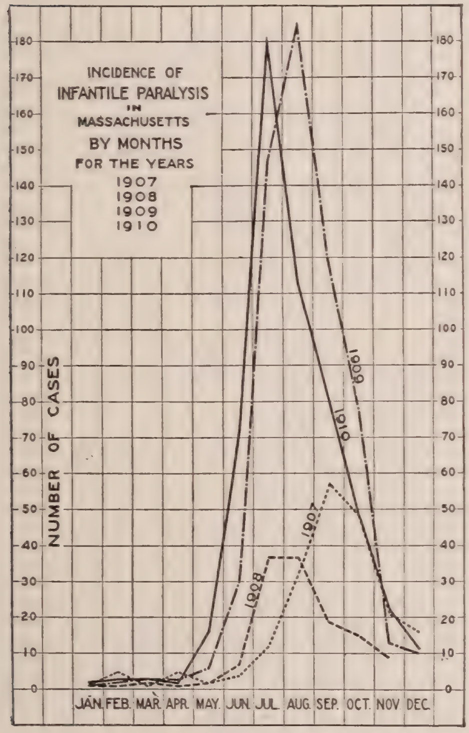
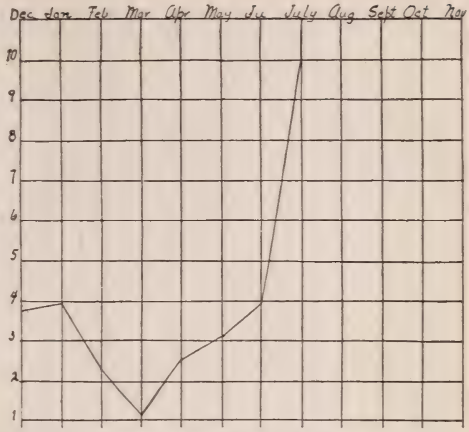


CHART 4. From Report of Mass. State Board of Health. 1910.

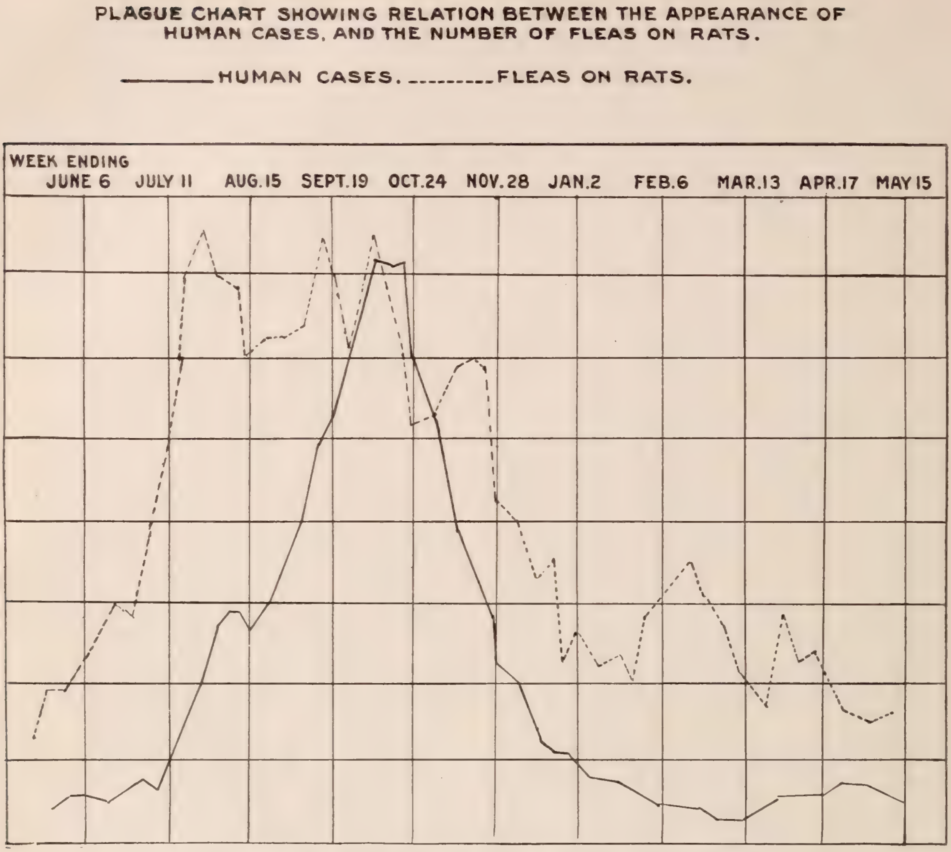


Seasonal Abundance of the Cat Flea (*Ctenocephalus felis*).

CHART 5.

INTERRUPTED EPIDEMICS.

The descending flea curve would explain what may be called *interrupted epidemics*, and which are seen especially in the late fall or early winter. Of the 1914 epidemic in Vermont, Caverly says, "the epidemic began in the village of Barton, the first cases occurring respectively on July ninth, eighteenth, and twenty-second. The *first* cases occurred in that neighbor-



PLAGUE CHART SHOWING RELATION BETWEEN THE APPEARANCE OF HUMAN CASES, AND THE NUMBER OF FLEAS ON RATS.

Chart 6. From Belgium British Plague Commission.

hood in Barton Village, where the *last* cases in the outbreak of 1913 occurred in the month of November." As stated previously, the first cases in Barton in 1914 were located near the grist mills. Why did not the 1913 focus in Barton continue through the winter; or why did it not recur in the earlier months of 1914, for it is quite apparent that the infection persisted in one spot through the winter? If we refer again to chart No. 5, showing the cat-flea curve, we find that not until July does this curve reach any abnormal height. The coincidence of this sudden jump in the flea curve with the reappearance of the infantile paralysis cases in July is certainly striking and suggestive.

Influence of Geologic Formation.

A study of infantile paralysis in Philadelphia, by Dr. Charles S. Miller (8) brought out the interesting fact that geologic formation of the land may be of importance. He divided up the city into four principal classifications: sand and gravel, feldspar-mica, rock and quartz, tidal flats, and mixed formation, with the following result:

PHILADELPHIA CASES BY WARDS.

Geological formation	Wards	Area in acres	Population per acre	Cases	Rate per 100,000 population
Sand and gravel	21	15,212.16	39.294	111	18.56
Arkose sand and gravel	9	8,072.32	42.941	67	13.55
Quartz, feldspar, etc.	2	11,435.8	9.246	35	33.09
Tidal flats	1	5,199.44	8.046	21	50.21
Mixed	10	38,927.36	9.854	86	22.40

Miller says, concerning this table, "It will be noted that the density of population per acre is greater in the sand and gravel groups, and the rate of morbidity per 100,000 population is greater in the section of city overlooking the tidal flats." A greater prevalence of rats over tidal flats is highly probable.

RELATION TO WATER FRONTS, SEWERS, SLUMS, RIVERS, BROOKS, ETC.

The relation of bubonic plague to these localities is marked. Brues found in New York City (1916) a special grouping of cases on the water fronts. (See chart No. 7.) The same was true of Boston in 1916. In Boston in 1916, at least two sailors working on the affected water fronts, acquired infantile paralysis and died.

Furthermore, although the well-to-do do not escape infection with infantile paralysis, I agree heartily with the statement of Dr. Charles K. Mills of Philadelphia that a very great majority of cases occur in surroundings which are unsanitary and have all the ear-marks of rat and flea infestation. As to the cases among the rich, the proximity of stables, the possession of cats and dogs, and the constant influx of packages of merchandise may well bring about the necessary rat and flea influence essential to infection.

INFANTILE PARALYSIS IN THE TRENCHES.

As is well known, the trenches in the war area are over-run with rats, these rodents having been driven into the open by the destruction of houses, barns, etc. Under the rat theory, infantile paralysis was to be expected among the soldiers, though, of course, adults are not highly susceptible to the disease. Such a small epidemic of ten cases has been described by Etienne (9). It was confined to a sharply defined section of trenches and to a definite body of troops. The affected troops had no more infantile paralysis after they left the special trenches, and the troops which occupied the trenches after them did not have the disease. The history suggests a contagious agent with a very short period of activity, restricted possibly to an intermediary cycle in an insect. This self-limitation of epidemics to one period of a few weeks has been noted by several observers. Frost, for instance, pointed out the fact that in a city, epidemic infantile paralysis was

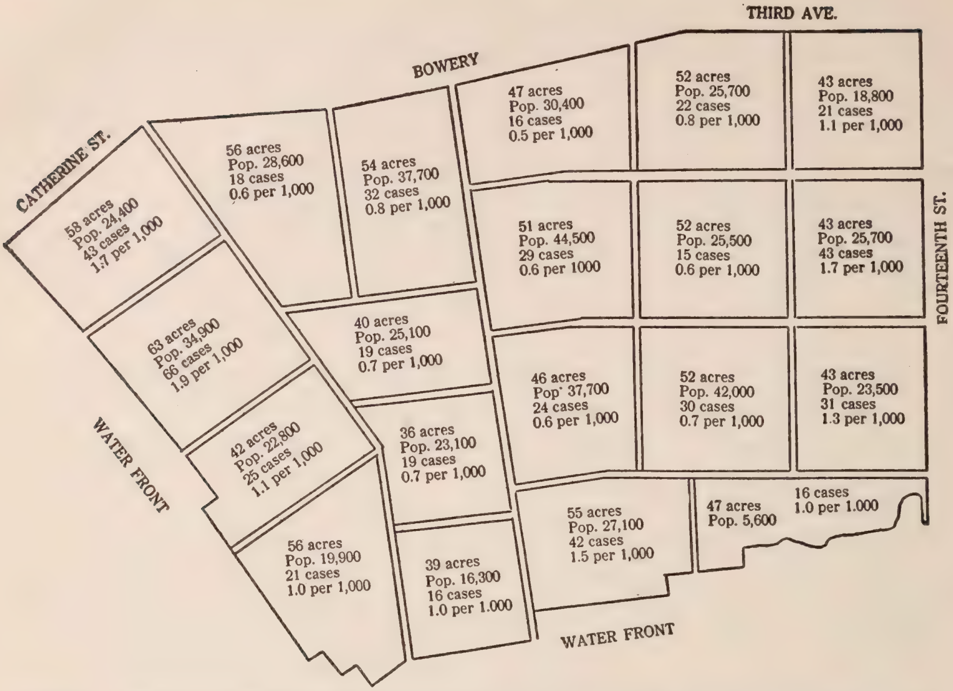

THIRD AVE.
BOWERY
CATHERINE ST.
FOURTEENTH ST.
WATER FRONT
WATER FRONT
58 acres Pop. 24,400 43 cases 1.7 per 1,000
56 acres Pop. 28,600 18 cases 0.6 per 1,000
54 acres Pop. 37,700 32 cases 0.8 per 1,000
47 acres Pop. 30,400 16 cases 0.5 per 1,000
52 acres Pop. 25,700 22 cases 0.8 per 1,000
43 acres Pop. 18,800 21 cases 1.1 per 1,000
63 acres Pop. 34,900 66 cases 1.9 per 1,000
40 acres Pop. 25,100 19 cases 0.7 per 1,000
51 acres Pop. 44,500 29 cases 0.6 per 1000
52 acres Pop. 25,500 15 cases 0.6 per 1,000
43 acres Pop. 25,700 43 cases 1.7 per 1,000
42 acres Pop. 22,800 25 cases 1.1 per 1,000
36 acres Pop. 23,100 19 cases 0.7 per 1,000
46 acres Pop' 37,700 24 cases 0.6 per 1,000
52 acres Pop. 42,000 30 cases 0.7 per 1,000
43 acres Pop. 23,500 31 cases 1.3 per 1,000
56 acres Pop. 19,900 21 cases 1.0 per 1,000
39 acres Pop. 16,300 16 cases 1.0 per 1.000
55 acres Pop. 27,100 42 cases 1.5 per 1,000
47 acres Pop. 5,600 16 cases 1.0 per 1.000

Chart 7. Population 539,300; 545 cases; incidence 1.01 per 1,000.—Part of the lower east side of Manhattan, showing the area, population and incidence of poliomyelitis in the several sections. N. Y. City Report. 1916.

on the decrease in one ward while rising in a neighborhood ward. (See chart No. 8.) This same phenomenon has been noted in bubonic plague in Rohtak, India, by the Indian Plague Commission. In New York City in 1916 "very exceptionally were secondary cases separated from the primary case (in the same family) by a longer interval than two weeks. Similar results were obtained in the study of multiple cases in one house; the majority of the cases would appear to have had a simultaneous infection." (N. Y. City Report 1916, p. 121.)

Radial Distribution.

Bubonic plague is said to spread (a) by contiguity and (b) *per saltum*. A considerable number of cases will group themselves together in neighboring houses then a leap (*per saltum*) will take place and a new collection of cases will develop by contiguity. Between the two foci, will be an area entirely unaffected. This phenomenon in plague is due, of course, to migration of infected rodents but it is also quite characteristic of infantile paralysis. A remarkable example of radial spread is shown in chart No. 9 taken from the 1912 Swedish Report. It is impossible to believe that a so regular distribution could be caused by human beings with their irregular comings and goings. A preliminary gradually spreading rodent infection seems much more reasonable and probable.

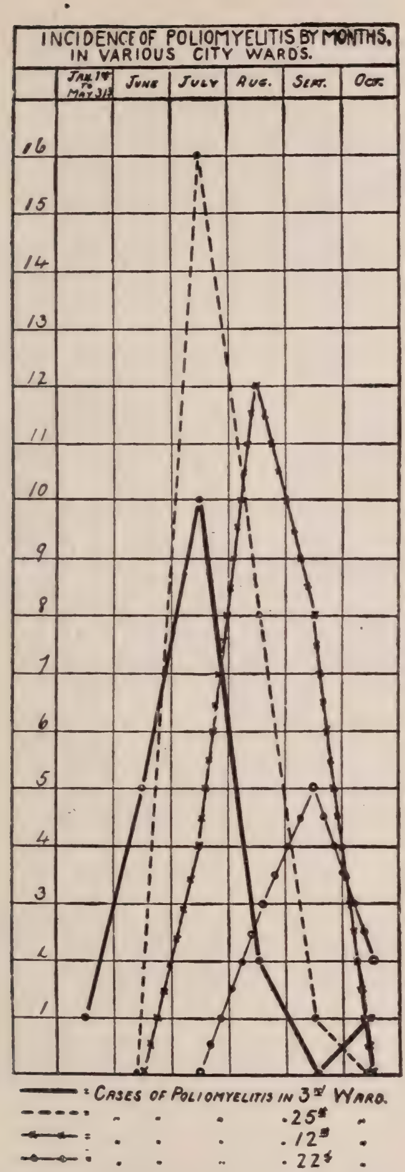


Chart 8. Buffalo, N. Y. (Frost) 1912.

Seat of Primary Infection.

In bubonic plague the primary bubo is, in the great majority of instances, in the groin. This is, of course, because the flea reaches most easily the legs of his victim. In infantile paralysis, the vast majority of children are paralyzed in the lower extremities either alone or in combination with other parts of the body. (See chart No. 10.) We have, furthermore, the following experimental data as determined by Zappert, Leiner and Wiesner (10). These observers found it to be practically always true that in monkeys the initial paralysis depended upon the site of the inoculation. If the inoculation was made into the sciatic then the initial paralysis came in the leg, if into the median then the arm, etc., the infection traveling along the lymphatics to the spinal cord. The above-mentioned writers suggested that, paralyzed legs in children being in marked predominance, infection might have taken place, in some instances at least, as in tetanus, through breaks in the skin of the lower extremities. The possible relation of flea bites to this aspect of the disease did not occur to these writers probably because, in 1909, the rat and flea theory of bubonic plague had not been fully substantiated. The conclusion, of course, which I desire to draw from these combined observations is that this marked excess of paralysis in the lower extremities is strong presumptive evidence that the infection takes place through the lower extremities. The fact that the patients almost never give a history of flea bites is of no contradictory value, for in bubonic plague such a history is rarely forthcoming.

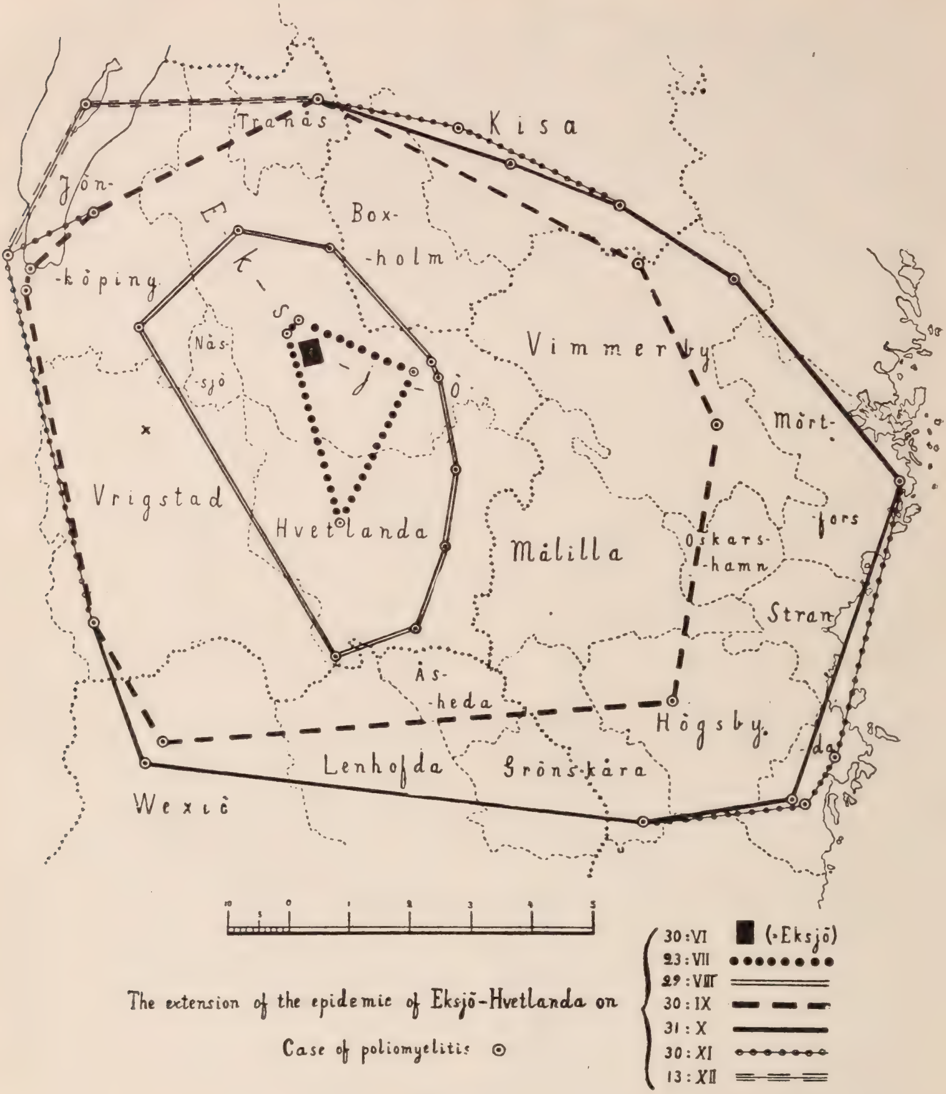


CHART 9.

IMMUNITY OF A NEIGHBORHOOD ONCE INFECTED.

In my previous communication, I discussed the immunity enjoyed for one or more years by a place once severely infected, and ascribed this immunity, not to a widespread but unrecognized involvement of a large part of the human population, but to an immunizing of the rat population with, possibly, the inheritance of this acquired immunity. This question has come up in connection with bubonic plague, the rats of one city being much more resistant to plague than those of other cities. The explanation,

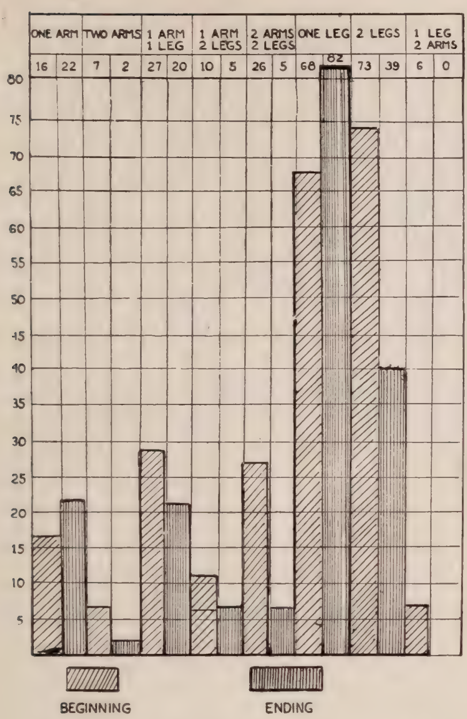


Chart 10. Showing predominance of lower extremities in initial and final paralysis of human beings. (Zappert, Leiner, and Wiesner.)

which might apply equally to infantile paralysis, is that during an epizootic the susceptible rats die, a very resistant race remaining in the ascendant for a long time.

Persistence of Infection in Certain Localities Over Long Periods of Time.

Bubonic plague is well known to exist in the rats for considerable periods of time before and after the human epidemic. I believe the same to be true of infantile paralysis; that the disease is always present in the rats, but appears in human beings only when rat infection and flea infestation are at their maximum. A third facto is probably essential, furthermore, and that is that the rats infected must, in the main, be young rats. That certain streets or even certain houses may be especially prone to the disease is shown by chart No. 11. In the Springfield epidemic of 1912, three houses which had been infected in 1910 showed instances of infantile paralysis. They were, however, in different families. Wickman mentions a case where a family having suffered from the disease moved out in October. A child of a family which moved in shortly afterwards came down with infantile paralysis within a few weeks. A study of Boston cases over a series of years shows very clearly how infantile paralysis perists in sporadic form over considerable periods of time. (Chart No. 12.) There has been no explanation forthcoming as to why single cases in any year do not

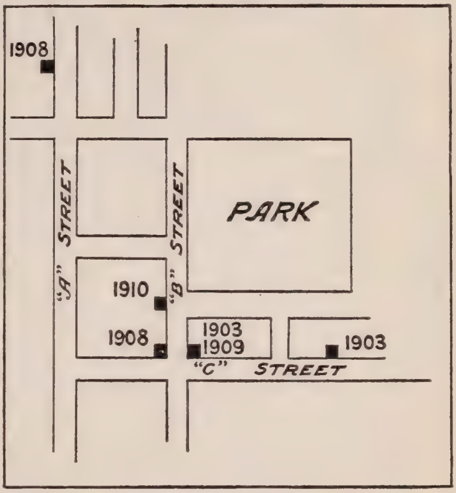


Chart 11. From Report of Mass. State Board of Health. 1910.

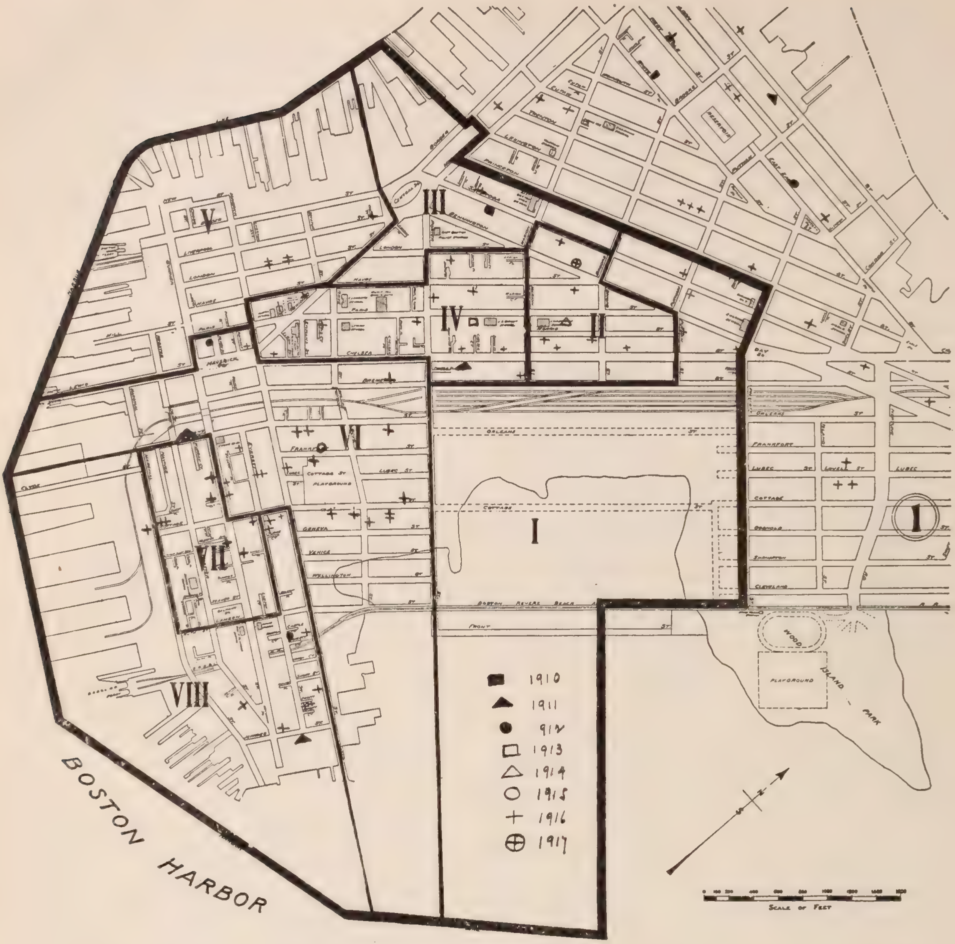


Chart 12. Showing sporadic cases in off years together with epidemic cases of 1916.

spread, especially where, through congestion of the population, abundant opportunity for personal contact is at hand. Such a situation, however, is easily explained by the rat and flea theory because, according to this hypothesis, there can be, just as in bubonic plague, no well marked human infection until the rat and flea curve have risen to a certain point. Ordinarily this rodent level is low and projects beyond the human level only occasionally. Under extraordinary conditions, however, the level rises rapidly and to such heights that the human involvement reaches epidemic proportions.

Multiple Cases and the Rat Theory.

Another point of similarity shown by infantile paralysis and bubonic plague is seen in the fact that it is rare to have more than one case in a single house or family. The Massachusetts figures for infantile paralysis are as follows:

Families with more than one case (1908–1910):*

	Cases	*Per cent*
One case	357	92.24
Two cases	27	6.97
Three cases	3	.77
Total	387	

For bubonic plague in Sidney, Australia, the figures were as follows: 289 cases lived in 216 dwellings; 266 had single case only.

SUMMARY.

1. Although the virus of infantile paralysis has been demonstrated in the secretions and excretions of persons sick with the disease and (b) healthy third persons who have or have not been in contact with patients, and although such secretions and excretions may in animal experiment remain active for many months, the epidemiological facts are strongly against the theory that infantile paralysis is spread from person to person by direct or indirect contact. On the other hand,—

2. The epidemiology of infantile paralysis corresponds so remarkably with that of bubonic plague, a disease known to be due to the rat and flea, that it can be stated with great probability that human infantile paralysis is due to a precedent and underlying infection of rodents.

3. As with bubonic plague, final proof as to the rôle of the rat and flea in infantile paralysis must rest in elaborate laboratory investigation.

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* The inclusion of abortive cases in this table would increase the percentage of multiple cases somewhat, but not enough to vitiate the argument. In New York City in 1916, 96% of the families affected had one case only.

NOTES.

(1) This investigation has been supported by a fund contributed to the Massachusetts General Hospital by the following gentlemen: James J. Storrow, Charles Jackson, Wallace Pierce, Arthur Perry, James H. Proctor, R. L. Studley, Allan Emery, William Endicott, and Frank G. Webster (of Boston). Also J. P. Morgan and Albert Strauss (of New York); Alvah Crocker and George R. Wallace (of Fitchburg, Mass.); and Winthrop Murray Crane (of Dalton, Mass.). Thanks are due furthermore for special privileges to Dr. Francis X. Mahoney, Health Commissioner of Boston, and to Dr. Francis P. Denny of the Brookline Board of Health.

(2) New York City Report of 1916.

(3) Stephens. *Medical Journal of Australia,* 1916, II, 423.

(4) Altman. *Australasian Medical Gazette,* 1897. July 3, p. 173.

(5) Conway. *New York State Journal of Medicine,* XVII, no. 6, p. 264.

(6) Kerley *Arch. Pediatrics,* 1917, XXXIV, 32–37.

(7) Lyons. *Psyche,* Vol. XXII, no. 4.

(8) Miller. *Bulletin Department Public Health and Charities, Philadelphia,* July, 1916.

(9) Etienne. *Bulletin de l'Academie de Medicine, Paris,* January 30, LXXVII, no. 5, p. 153.

(10) Zappert, Leiner and Wiesner. *Studien uber die Heine—Medinsche Kraukheit, Leipzig und Wien,* 1911.

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Annual Meeting, A. P. H. A., Chicago, Oct. 14-17.
Come, and Bring a New Member.

A LIFE TABLE FOR THE CITY OF NEW HAVEN.*

Louis I. Dublin, Ph. D.,
Statistician, Metropolitan Life Insurance Co., New York City.

THE following life table is presented first, for its own value as a measure of the vitality of the people of New Haven and, second, as an example to be followed by health officers and others interested in public health work in American states and cities. There are all too few such tables now available for our communities.

This table is based upon the population of 1910 (June 30th) and upon the deaths of the three years 1909, 1910 and 1911. The data for deaths were not available for each of the two sexes; hence, the table refers only to "persons." The basic data for both lives and deaths were available by five-year age periods. The figures for the individual years within the quinquennia were interpolated by means of Sprague's formulæ for "Osculatory Interpolation." The interpolations were checked by the graphic method wherever necessary. The populations in the first five years of age were derived from the number of births and deaths reported from 1904 to 1911 inclusive.

The resulting table is very regular up to age 75; thereafter, the values fluctuate because of the small number of lives exposed and because of the errors resulting from the incorrect statement of age.

The table indicates fairly favorable mortality conditions for the City of New Haven throughout the span of life. The mortality in the first year of life, which is represented by the value 112.91 per 1,000 births has been reduced materially during the last few years. The mortality is lowest at age 12 when less than two deaths occurred among every 1,000 living. After age 12 the rates increase regularly with each additional year of life. At age 20, 4.6 deaths occur in every 1,000 living at that age. At age 40 the number of deaths increase to 11.5 per 1,000. At age 60 the deaths are 39 for each 1,000 at that age and at age 75 the number of deaths is 97.1 for each 1,000. In other words, close to 10 per cent of those reaching this advanced age die in the course of a year. From this point onward the mortality rises very rapidly and at age 90 about 30 per cent die off in the course of the year.

More interesting perhaps are the figures in the last column, namely, those which show the expectation of life at each one of the ages. The first figure, namely, the expectation at age 0 covers the entire span of life which for New Haven is 49.37 years. This represents the complete expectation of life at the time of birth. At the beginning of the second year, the expectation is more than five years higher, namely, 54.59 years. That is because the very heavy mortality of infancy has been passed. The expectation increases in the third year of life to its maximum which is 55.22 years. The average after life time from this point onward continuously decreases. At age 10 it is 49.63 years; at age 25 the average length of life is nearly 37 years; at age 45 it is only 22.34 years which means that those at 45 have an even chance of surviving to age 67.34; at age 60 the average expectation is 12.93 years and at age 75 the expectation is only 6.74 years additional.

It is almost impossible at this time to compare the facts for New Haven with those of other American cities. The life tables recently published by the Federal Government are for the Registration States as of 1910 and for certain geographic units within the Registration Area. The figures for the Registration States are more favorable than those for New Haven by about two years of after life; mortality is higher in urban communities than in areas like the Registration States which contain a large rural population. A fairer comparison could be made with the facts for the cities of the original Registration States but unfortunately the tables as presented give the facts for each of the two sexes separately and not for both sexes combined. A rough combination for the purpose of comparison indicates that the values for New Haven are very much like those for both sexes in the Registration Cities.

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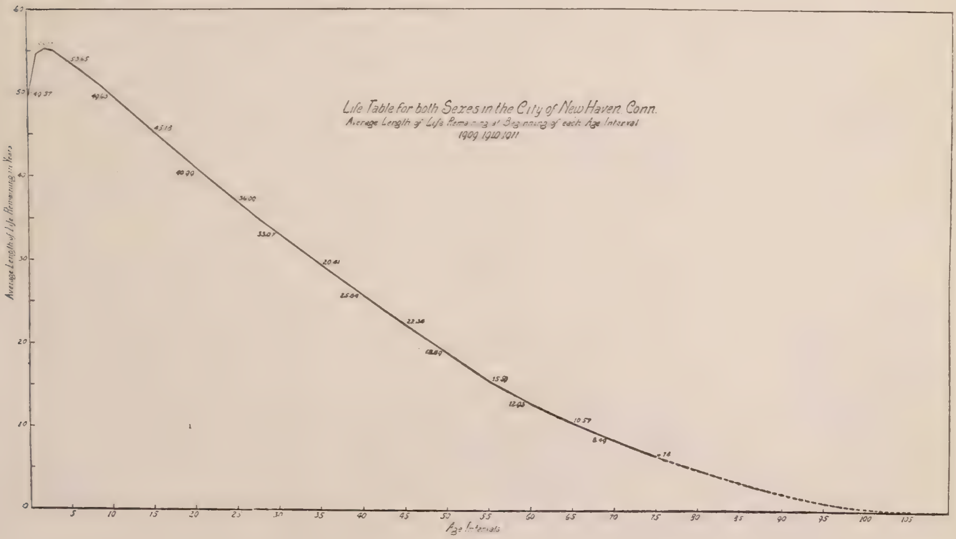
* This table was constructed by the students in vital statistics in the Department of Public Health, Yale University, as a part of the requirements of the course.

It is hoped that the figures as now prepared will be repeated for the three-year period centering around 1920, and that the work now being carried on by the health authorities of New Haven will be reflected in a material reduction in mortality with a corresponding increase in the expectation of life. It is hoped also that other health officers will find it possible to prepare similar figures for their respective communities, especially where the populations are as large as for New Haven. Public health work will be placed on a much safer foundation by such means.

LIFE TABLE FOR BOTH SEXES IN THE CITY OF NEW HAVEN, CONN. 1909–1911.

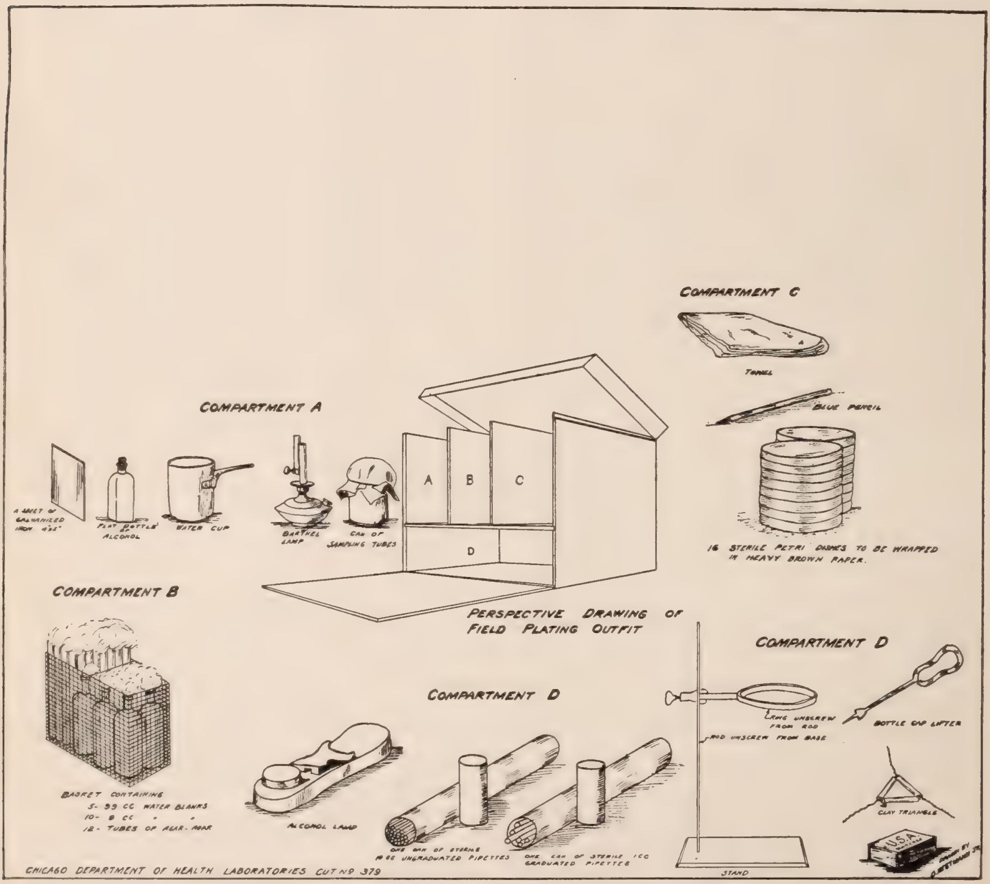
Age interval	Number at beginning of age interval	Number dying in age interval	Probability of dying during age interval	Complete expectation of life
x	l_x	d_x	q_x	$\overset{o}{e}_x$
0	100,000	11,291	.11291	49.37
1	88,709	2,594	.02924	54.59
2	86,115	1,165	.01353	55.22
3	84,950	579	.00682	54.97
4	84,371	471	.00558	54.34
5	83,900	420	.00500	53.65
10	82,331	226	.00274	49.63
12	81,932	162	.00198	47.86
15	81,368	250	.00307	45.18
20	79,858	368	.00461	40.99
25	77,829	441	.00566	36.99
30	75,459	577	.00765	33.07
35	72,284	688	.00952	29.41
40	68,637	790	.01151	25.84
45	64,484	885	.01373	22.34
50	59,790	1,021	.01707	18.89
55	54,139	1,423	.02628	15.59
60	45,875	1,791	.03903	12.93
65	36,583	1,899	.05190	10.57
70	26,845	1,932	.07198	8.49
75	17,453	1,695	.09711	6.74



AN INEXPENSIVE FIELD PLATING OUTFIT FOR BACTERIAL EXAMINATION OF MILK.*

F. O. Tonney, and J. L. White,
Chicago, Ill.

THE apparatus here described† was designed several years ago in the Health Department Laboratories to meet the need of a compact plating outfit in connection with the inspection of country pasteurizing plants and creameries. The complete outfit is contained in a hand grip sixteen inches long, nine and one-half inches wide and ten and one-half inches high. The outfit case is constructed of bass wood according to the specifications on the accompanying diagram. It is covered with black imitation leather. The case is divided into four compartments by wooden partitions designated in the diagram as compartments A, B, C and D. In compart-



Equipment of Field Plating Outfit.

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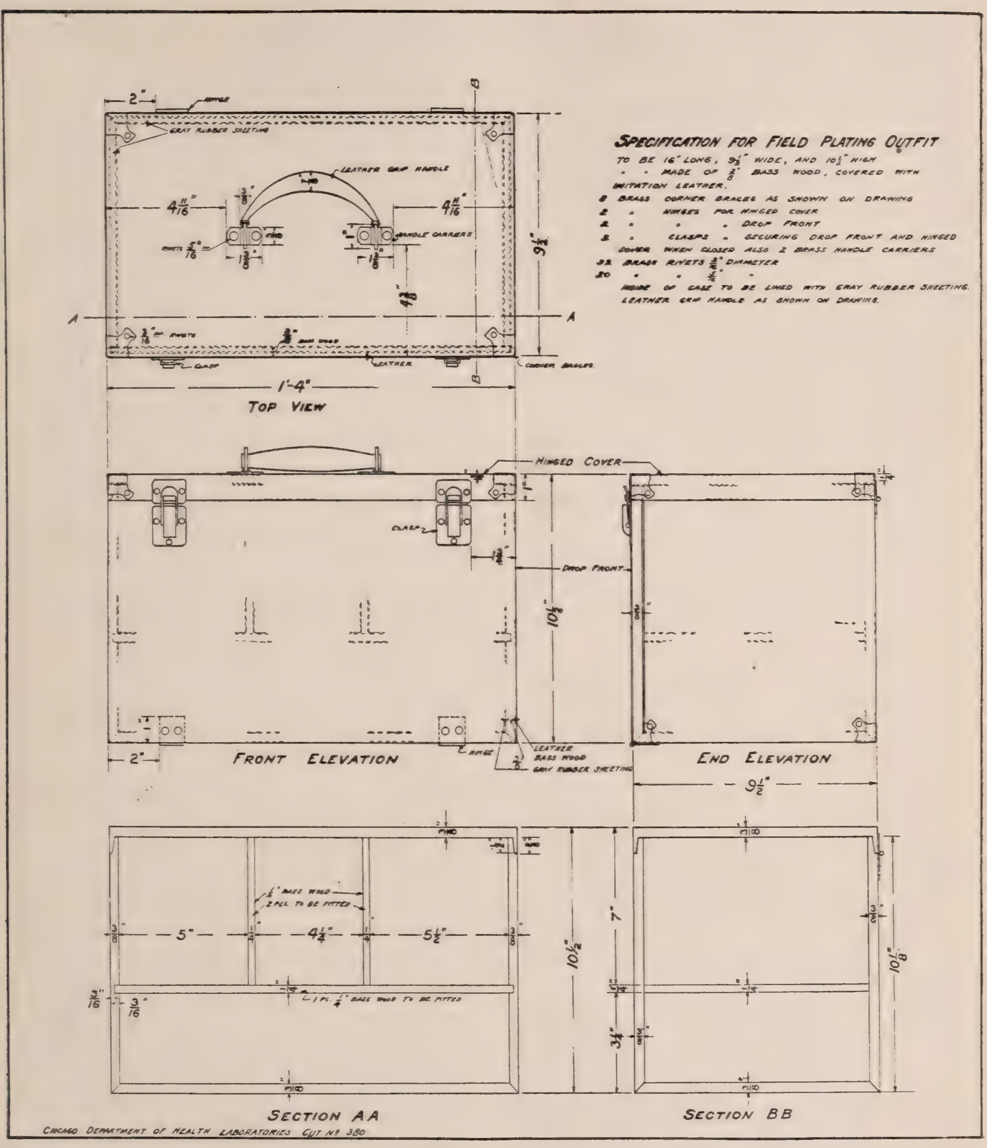
* From the Chicago Health Department Laboratories.

† See I. Tonney, A. J. P. H., Vol. II, No. 5, p. 364.



SPECIFICATION FOR FIELD PLATING OUTFIT
TO BE 16" LONG, $9\frac{1}{2}$" WIDE, AND $10\frac{1}{2}$" HIGH
" " MADE OF $\frac{3}{8}$" BASS WOOD, COVERED WITH IMITATION LEATHER.
8 BRASS CORNER BRACES AS SHOWN ON DRAWING
2 " HINGES FOR HINGED COVER
2 " " " DROP FRONT
2 " CLASPS " SECURING DROP FRONT AND HINGED COVER WHEN CLOSED ALSO 2 BRASS HANDLE CARRIERS
32 BRASS RIVETS $\frac{3}{16}$" DIAMETER
20 " " $\frac{5}{16}$" "
INSIDE OF CASE TO BE LINED WITH GRAY RUBBER SHEETING.
LEATHER GRIP HANDLE AS SHOWN ON DRAWING.

CHICAGO DEPARTMENT OF HEALTH LABORATORIES CUT NO 380

ment A are placed a Barthel alcohol lamp, a block tin cup for melting agar inverted over the lamp, a can of sampling tubes containing seven test tubes in all and a flat bottle of alcohol. In compartment B are placed five 99 cc. water blanks in four-ounce tincture bottles, ten 9 cc. water blanks in six-inch tubes and twelve test tubes of agar. Compartment C contains sixteen sterile petri dishes wrapped in heavy paper and two towels. Compartment D contains one can of sterile 10 cc. pipettes for collecting samples, one can of sterile 1 cc. pipettes for making dilutions, one iron ring stand with rod and ring unscrewed, one bottle cap lifter, one blue pencil, and one small flat alcohol lamp. The outfit is sufficient for making bacterial counts of six milk samples if two dilutions are made of each sample. If three dilutions are made of each sample, four samples may be examined, allowing three plates for control tests of the medium and water blanks, and one plate for emergency. The container for the sample tubes which has been described elsewhere, is used as an ice receptacle to preserve the samples if they cannot be plated immediately after collection. The container is a syrup can of one pint capacity with a depressed cover in which are punched seven holes a little larger in diameter than the test tubes used in collecting samples. The can and cover are given a coat of rust proof paint, both inside and out. For the sampling tube a test tube four inches by five-tenths inch is used, about which is placed a rubber-band collar to prevent the tube from dropping through the opening. The necessity of a rubber-band collar may be obviated by using a test tube which is a trifle longer than the height of the can. A rubber cloth is placed over the can filled with test tubes to protect the cotton plugs from contamination. A rubber-band is snapped about the cloth cover to hold it in place. The pipette can is made of galvanized iron with folded seams unsoldered. It is twelve inches long and has a cap three inches long fitting snugly over the open end. The sampling pipettes may be made in the Laboratory from soft glass tubing, one-half inch in diameter, tapered at one end. It is not necessary to graduate these pipettes. The small alcohol lamp is a flat type sold for heating hair curling-irons. The cost of the carrying case in quantities of six or more should not exceed five dollars per case.

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A SIMPLE AUTOMATIC THERMOSTAT FOR USE IN AN ELECTRIC INCUBATOR.*

Fred O. Tonney,
Chicago, Ill.

THE device herein described has been used by the writer for about eight years, with entire satisfaction. By means of it, any icebox or suitable cabinet may be converted at nominal expense into a bacteriological incubator which will automatically maintain the required temperature within one-half degree Centigrade. An icebox is especially well adapted to the purpose because of its insulated construction. A tall icebox of the four-door type is preferable to other designs, since it permits of better air circulation and provides ample incubating space away from close contact with the heaters. The electrical control device which operates on both direct and indirect currents, consists essentially of a "Mesco" thermostat which is obtainable at electrical supply stores. The construction of the thermostat must be modified in the following respects, as is shown in detail in the accompanying diagram No. 1. The copper contacts are removed and replaced by a fifteen-gauge platinum wire. The insulated wire beneath the base of the thermostat is disconnected from the lower set screw to the screw attached to the upright arm carrying the upper set screw. Thus the insulated post is connected directly to the upper set screw. Care must be exercised to make these insulations perfect. The lower set screw and the binding post on the upright arm are removed entirely. When reassembled, the apparatus appears as in diagram No. 2.

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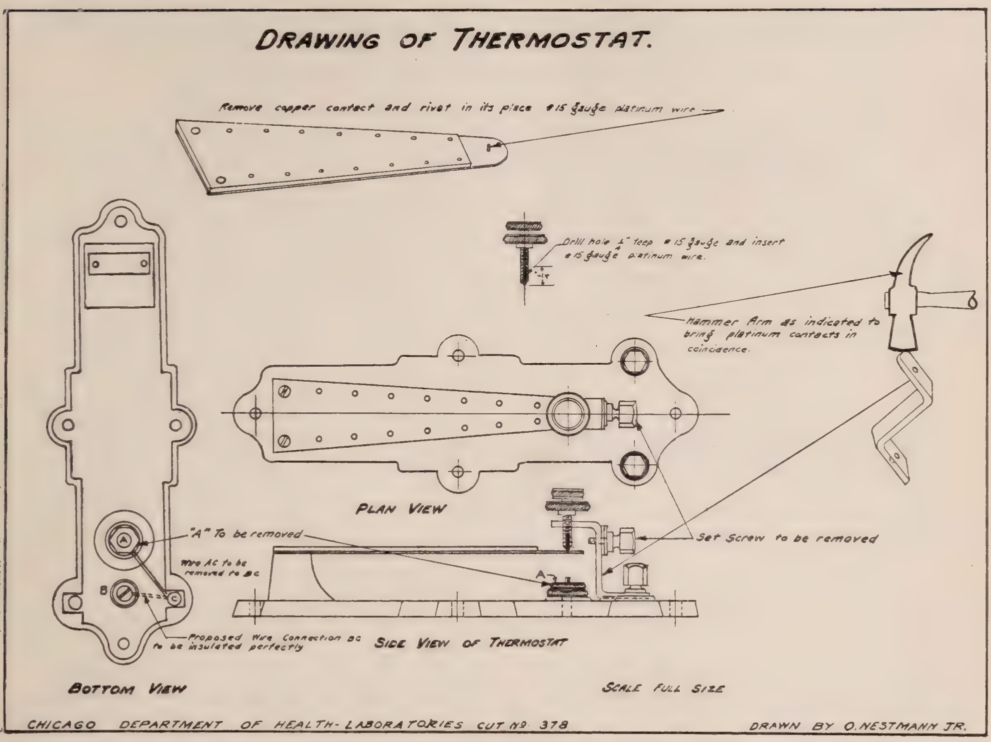
* From the Chicago Health Department Laboratories.


DRAWING OF THERMOSTAT.
Remove copper contact and rivet in its place #15 gauge platinum wire
Drill hole 1/4" teep #15 gauge and insert #15 gauge platinum wire.
Hammer Arm as indicated to bring platinum contacts in coincidence.
PLAN VIEW
"A" To be removed
Wire AC to be removed to BC
A
B
C
Set Screw to be removed
Proposed Wire Connection BC to be insulated perfectly
SIDE VIEW OF THERMOSTAT
BOTTOM VIEW
SCALE FULL SIZE
CHICAGO DEPARTMENT OF HEALTH - LABORATORIES CUT No. 378
DRAWN BY O. NESTMANN JR.

Connections. (See diagram No. 3.) A lamp socket is tapped and the wires are tested by touching the terminals to a piece of cotton, wet with potassium iodide solution. A brown stain appears at the positive pole. The positive wire is now carried to the heater which consists of two or three sixteen candle power, one hundred and ten volt carbon filament lamps, connected in parallel, or nichrome wire of equal resistance. The heater is placed on the floor of the icebox. The wire from the heater is next carried to the insulated pole of the thermostat. The thermostat is attached through a piece of rubber insulator to the under side of the top of the icebox. The negative wire of the lamp socket is run directly to the grounded pole of the thermostat. An extension circuit is now connected to the thermostat by carrying a wire from each pole to a sixteen candle power, two hundred and twenty volt carbon filament lamp, which is placed on top and outside of the icebox. The purpose of the extension circuit is to throw in resistance in lieu of breaking the main circuit when the thermostat operates, thus obviating a spark at the contacts. While the incubator is in operation, the current through the heaters on the main circuit is never actually broken, but is reduced to a negligible quantity by the added resistance of the extension circuit when the thermostat breaks contact. The two twenty volt lamp in the extension circuit serves also as a pilot lamp. The connections are now complete and if the insulations are perfect the thermostat will operate.

Adjustment. Place a thermometer in the incubator and adjust the set screw of the thermostat so that the lamps of the heater are lighted. The adjusting disc is screwed

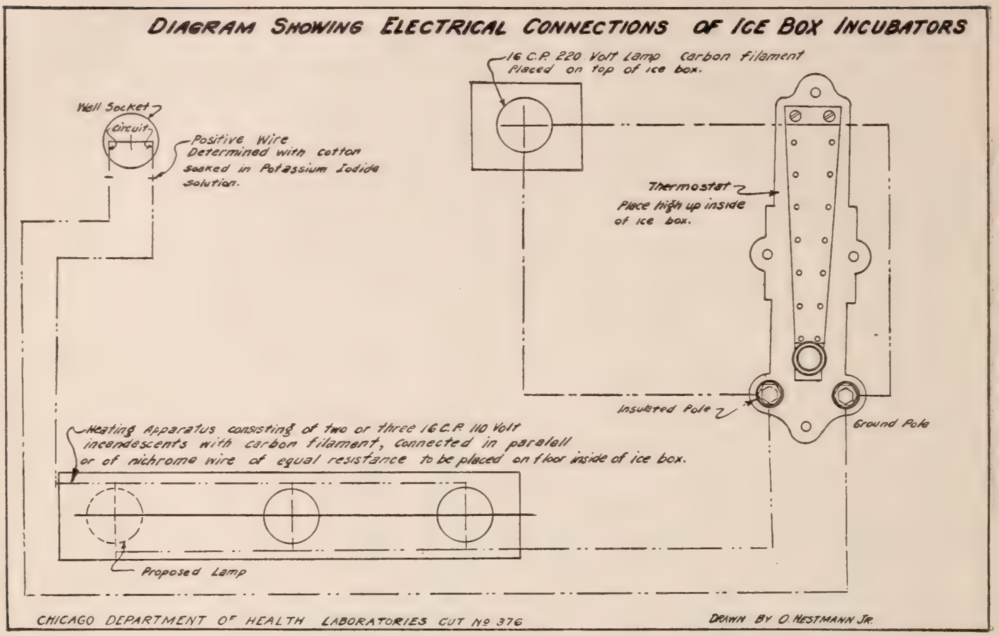
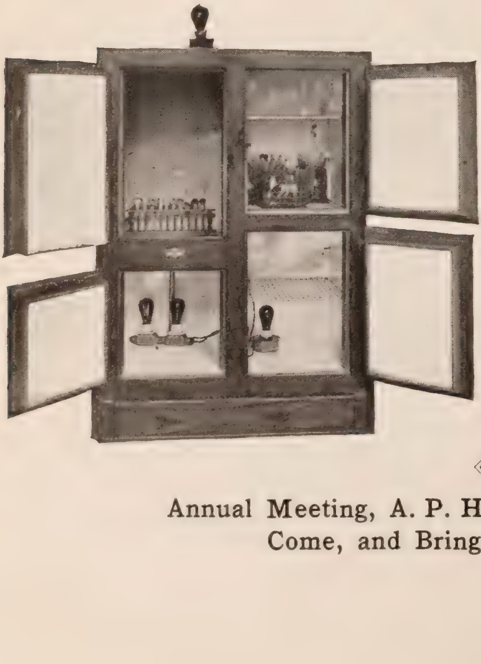


DIAGRAM SHOWING ELECTRICAL CONNECTIONS OF ICE BOX INCUBATORS
16 C.P. 220 Volt Lamp carbon filament Placed on top of ice box.
Wall Socket
circuit
Positive Wire Determined with cotton soaked in Potassium Iodide solution.
Thermostat
Place high up inside of ice box.
Insulated Pole
Ground Pole
Heating Apparatus consisting of two or three 16 C.P. 110 Volt incandescents with carbon filament, connected in paralell or of nichrome wire of equal resistance to be placed on floor inside of ice box.
Proposed Lamp
CHICAGO DEPARTMENT OF HEALTH LABORATORIES CUT No 376
DRAWN BY O. HESTMANN JR.

inward to raise the temperature and outward to lower the temperature. Close the incubator and wait until the heaters are cut off and the pilot lamp in the extension circuit lights up. The lighting of the pilot lamp, which burns with a dull glow, shows that the maximum degree of temperature at which the thermostat is set has been reached. Adjustment should be made only at this time. Do not attempt to change the thermostat while the heaters are burning steadily. When approximately the desired temperature is obtained, the incubator is closed over night and is readjusted more closely on the following morning. Thereafter, it usually requires no further attention. It is advisable about once in six weeks to freshen the platinum contacts slightly with a piece of fine sandpaper, as prolonged use causes the points to corrode slightly and stick. If lamps are used for the heater, a supply of globes should be kept on hand to replace those burned out. If nichrome wire is used, the heater will last indefinitely without further attention.



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Annual Meeting, A. P. H. A., Chicago, Oct. 14-17.
Come, and Bring a New Member.

CHEMICAL ANALYSES OF BACTERIOLOGICAL BOUILLONS.

F. C. Cook and Edwin LeFevre,
Bureau of Chemistry, U. S. Department of Agriculture, Washington, D. C.

THE following analyses of bouillons were made in order to obtain definite information in regard to the extent of variation in chemical composition of bouillons prepared according to standard procedures for bacteriological purposes from the following material: (1) fresh beef, (2) meat extract, (3) fresh liver. Figures are also reported showing the loss of peptone resulting from the addition of the peptone to an infusion of fresh beef before coagulation and filtration of the coagulable protein of the infusion mixture.

The bouillons analyzed were carefully prepared by the cold infusion method. Five hundred grams of finely ground beef or liver were infused in 1,000 cc. of water for 24 hours and the fluid obtained after pressure and filtration was made up to 1,000 cc.

The meat extract bouillons were prepared by taking 3 grams of Liebig's beef extract, 10 grams of Wittes peptone and making to a volume of 1,000 cc. with water.

Three bouillons of each series, or nine in all, were analyzed and the results are reported in Table I. The solids, ash, total phosphorus as phosphoric acid and total nitrogen were determined according to the methods of the A. O. A. C. (1). The protein nitrogen was separated from the peptone and amido nitrogen by precipitation with zinc sulfate according to the procedure of Bömer (2). The purin nitrogen was estimated by the method of Schittenhelm (3) as applied to meat extracts by Cook (4). Creatin was determined by the Folin (5) method and total creatinin by the Benedict-Myers (6) autoclave method.

The analyses of the three meat extract bouillons given in Table I which were prepared from the same brand of meat extract showed practically identical composition. The results for solids, ash, phosphoric acid, total nitrogen and purin nitrogen were lower than for the beef or liver bouillons. The samples of beef bouillon prepared as described above proved to be of fairly uniform composition and were considerably higher than the three meat extract bouillons in all of the constituents with the exception of protein which was present in practically equal amounts in all three series of bouillons. The beef bouillons contained considerably more creatin and creatinin than the meat extract or liver bouillons.

Similarly the samples of liver bouillon proved subject to greater variation than either of the other two bouillons. All of the constituents of the liver bouillons were present in larger amounts, with the exception of creatin and creatinin, than in the meat extract or beef bouillons. While these findings which are based on the analyses of a small number of samples cannot be regarded as conclusive, neverthe-

TABLE I.

CHEMICAL ANALYSES OF BEEF, MEAT EXTRACT, AND LIVER BOUILLONS.

	Solids, per cent	Ash, per cent	P_2O_5, per cent	Total nitrogen, per cent	Nitrogen pptd. by zinc sulphate, per cent	Purin nitrogen, per cent	Creatin, per cent	Creatinin, per cent
Beef bouillon:								
1..........	2.50	0.81	....	.24	.08	....	.044	.025
2..........	2.52	0.80	....	.24	.09	....	.054	.022
3..........	2.94	0.95	.094	.29	.09	.010	.054	.052
Meat extract bouillon:								
1..........	1.81	0.65	....	.18	.10	....	.003	.015
2..........	1.70	0.57	....	.17	.10	.002	.006	.014
3..........	1.76	0.62	.025	.18	.09	.002	.005	.015
Liver bouillon:								
1..........	4.64	0.84	....	.48	.11	0	Trace	.001
2..........	3.86	0.92	....	.31	.10	0	Trace	.001
3..........	4.19	0.99	.111	.37	.11	.012	.005	.010

less, they are believed to represent the comparative character of these three classes of bouillons.

The analyses reported in Table II were made in order to obtain information in regard to the extent of loss of peptone which resulted from the addition of Wittes peptone to beef juice prior to coagulation and filtration.

Three beef juices were prepared by using 500 grams of finely ground beef and 1,000 cc. of water. This mixture after standing 24 hours was pressed and the resulting liquid made to 1,000 cc. with water.

The coagulable protein was determined in 100 cc. portions of the beef juices. The solution was neutralized, 1 cc. of tenth normal acetic acid added and boiled for 2 minutes. The solution after standing for 10 minutes on the steam bath was filtered and washed with 50 cc. of hot water and the nitrogen determined in the precipitate by the Kjeldahl-Gunning method.

The results in Table II showed that beef juice A-1, B-1, and C-1 which contained no added peptone, varied but little in composition. Samples A-2, B-2 and C-2 which contained the added peptone were also of constant composition. The creatin and creatinin figures represent practically all creatin as only traces of creatinin were present. A little over one half of the added peptone was precipitated by the zinc sulfate. Sample C-1 contained 2.21 per cent solids and 0.33 per cent ash, and sample C-2 contained 3.22 per cent solids and 0.35 per cent ash. The 1 per cent increase of solids in C-2 over C-1 was due to the 1 per cent of added peptone.

The figures in Table II showed that on an average 12 per cent of the peptone was wasted when added before coagulation and filtration *i.e.*, the coagulum held 12 per cent of the peptone. This indicates clearly that the economical procedure is to add the pep-

TABLE II.

BEEF JUICES WITH AND WITHOUT THE ADDITION OF PEPTONE BEFORE COAGULATION AND FILTRATION.

		Total nitrogen, per cent	Coagulable nitrogen, per cent	Peptone nitrogen held in coagulum, per cent	Nitrogen pptd. by zinc sulfate, per cent	Creatin and creatinin, per cent
A	1. Beef juice alone	.257	.148	....	.157	.084
	2. Beef juice and peptone	.424	.166	10.8	.252	.082
B	1. Beef juice alone	.281	.165	....	.175	.107
	2. Beef juice and peptone	.437	.188	14.7	.255	.107
C	1. Beef juice alone	.282	.174	....	.176	.100
	2. Beef juice and peptone	.437	.190	10.3	.263	.097

tone to the filtrate from the coagulated beef juice.

The fact that higher bacterial counts are frequently obtained on media prepared from beef bouillon than on media made from beef extract, and the additional fact that certain organisms will grow on the former media which fail to grow on the latter find, we believe, a rational explanation in the larger amount of nutrient material present in the beef bouillon as shown in Table I.

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**Annual Meeting, A. P. H. A., Chicago, Oct. 14-17.
Come, and Bring a New Member.**

SURVIVAL OF TYPHOID BACILLI IN SOUR MILK.

By Penelope Marsh.

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CERTAIN communities in our population make a practice of drinking milk permitted to undergo souring spontaneously. The question arose whether it is necessary to subject the raw milk used for souring purposes to preliminary pasteurization in order to insure the destruction of the typhoid-paratyphoid group of bacilli, or whether any of those bacteria which might be present would not be destroyed by the acids developed in the souring process. In order to answer this question a series of tests was arranged, the results of which are given in the tabulations of this paper.

The subject of investigation is not wholly a new one, although the practical point of departure of this study may be peculiar. A brief survey of the earlier literature on the subject includes the following:

Cautley (1) found that typhoid bacilli which had been added in large amount to milk could be demonstrated in the living state for several days, and that the viability of these organisms depended on the number and character of the contaminating bacteria. In sterilized milk the typhoid bacilli were found to survive as long as four months, according to Bolley and Field (2).

Fraenkel and Kister (3) added an enormous dose (2, $\frac{1}{2}$ and $\frac{1}{3}$ loops) to 10 cc. of buttermilk. At room temperature the typhoid bacilli remained alive for three days, while at incubator temperature they died out after twenty-four hours.

Bruck (4) endeavored to approximate natural conditions and recovered the bacilli from sour cream for ten days after its separation from artificially infected milk. He also isolated them from buttermilk for the same period of time and from butter, prepared from infected cream, for twenty-seven days.

Bassenge (5) states that the typhoid bacilli are killed when the acid production reaches 0.3 per cent to 0.4 per cent and is maintained there for twenty-four hours. This opinion is not shared, however, by many other workers.

Krumwiede and Noble (6) say that "the typhoid bacillus is gradually killed in sour cream by the acids produced, the rate of destruction being proportional to the degree of acidity and the number of typhoid bacilli present." They find that typhoid bacilli are killed in about four days in a moderately contaminated cream, but that they will live longer if initial multiplication has occurred.

Lactic acid in varying amounts was added to milk containing typhoid bacilli by Trillat and Fouassier (7), and its inhibitive effect demonstrated. They also made a comparative study of the rate of multiplication of typhoid bacilli in broth and milk. In milk multiplication began at once, but in broth no development was noticed for twenty-four hours.

EXPERIMENTAL.

In order to determine the viability of the typhoid and certain related bacilli in milk undergoing natural acidification, the following tests were made: The method was to inoculate the milk samples and then to determine viability by culture and acidity by titration at specified intervals afterwards, the samples being kept at room temperature, which on the average was 15° C. (60° F.).

The milk was that purchasable in New York City and had, therefore, in the case of full milk, been pasteurized. The samples containing typhoid and paratyphoid bacilli were plated on brilliant green agar (containing 0.3 cc. of 1:1000 solution of the dye per 100 c.c nutrient agar), while the samples containing the dysentery bacillus were plated on Endo medium. The platings were approximately daily, as was the titration of acidity. The latter was performed as follows: 5 cc. of the milk were added to 45 cc. distilled water and heated to the boiling point, and 1 cc. 0.5 per cent phenolphthalein added as indicator. The N/10 NaOH was allowed to run into the fluid from a burette until it turned a delicate pink which did not disappear on heating. The acidity was measured in amounts of NaOH. At the outset of the experiment the milk samples to which the *B. typhosus* and *paratyphosus* were added was 0.7, and the sample to which *B. dysenteriæ* (Flexner) was added was 0.8.

To each of three-quart bottles of "B" grade milk was added one platinum loop of a 24-hour agar culture of *B. typhosus, paratyphosus,* or *dysenteriæ* (Flexner). The daily routine of culturing was first to stir each bottle with a sterile glass rod and then to plate one platinum loop of the sample. After incubating the plate at 37° C. over night, the approximate number of colonies was recorded, and an isolated colony was stained by Gram, planted on Russell's double sugar agar slant, and agglutinated with a specific serum.

Before the inoculation with the specific bacilli a loopful of each sample of milk was plated. The two bottles subsequently inoculated with *B. typhosus* and *paratyphosus* yielded in the brilliant green plates 15 to 20 colonies of large Gram positive and Gram negative bacilli and small Gram negative bacilli. The Endo plates yielded half a dozen staphylococcus colonies.

On the other hand, the plates made immediately after the inoculation gave havy growths in pure culture of *B. typhosus* and *paratyphosus* and a heavy growth of *B. dysenteriæ* in which two colonies of staphylococci were detected. Table I summarizes the result of this test. The ++ indicate abundant growth, + moderate growth, ± a few colonies.

The next experiment was made with the typhoid bacilli in Grade "B" pasteurized milk and in buttermilk. The preliminary titrations of four bottles of "B" milk were 1.0, 1.1, 1.1, and 1.2, and of the buttermilk 3.5, 4.2, 4.2, and 4.4.

The inoculations were performed as indicated. Tables II and III show briefly the result.

TABLE I.

VIABILITY OF *B. TYPHOSUS, B. PARATYPHOSUS,* AND *B. DYSENTERIÆ* IN MILK.

	Nov. 6	Nov. 7	Nov. 8	Nov. 9	Nov. 10	Nov. 12	Nov. 13	Remarks
B. typhosus								
acidity	.7	.7	1.4	2.6	2.6	2.8	4.9	Nov. 13, plate showed 2 extraneous colonies and no *B. typhosus*
culture	0	++	++	++	+	±	0	
B. paratyphosus								
acidity	.7	.7	1.0	3.1	4.0	4.3	4.8	Nov. 10, contaminating colonies. Nov. 12, no *B. paratyphosus*
culture	0	++	++	++	+	0	0	
B. dysenteriæ								
acidity	.8	.8	1.4	2.9	4.2	4.2	3.6	Nov. 7, two staphylococcus colonies. After Nov. 10 no *B. dysenteriæ.*
culture	0	++	++	++	0	0	0	

TABLE II.

VIABILITY OF *B. TYPHOSUS* IN FRESH MILK.

	Nov. 26	Nov. 27	Nov. 28	Nov. 30	Dec. 1	Dec. 3	Remarks
Bottle 1							
acidity	1.1	1.4	4.6	5.2	6.1		Nov. 30, heavy contamination. No *B. typhosus* present.
culture	0	+	++	0	0	0	
Bottle 2							
acidity	1.4	1.7	3.0	5.6	6.6		Heavy contamination Nov. 30. No *B. typhosus* present.
culture	0	0	+	0	0	0	
Bottle 3							
acidity	.9	1.1	4.4	6.0	6.3		Heavy contamination Nov. 30. No *B. typhosus* present after Nov. 27
culture	0	+	0	0	0	0	
Bottle 4							
acidity	1.0	1.1	4.0	5.1	5.3		Heavy contamination Nov. 30. No *B. typhosus* present.
culture	0	+	++	0	0	0	

TABLE III.

VIABILITY OF *B. TYPHOSUS* IN BUTTERMILK.

	Nov. 14	Nov. 15	Nov. 16	Nov. 17	Nov. 18
Bottle 1					
acidity	3.5	4.3	5.0	4.8	6.6
culture	0	+	+	0	0
Bottle 2					
acidity	4.2	4.5	6.4	5.5	6.9
culture	0	+	+	+	0
Bottle 3					
acidity	4.2	4.3	5.5	5.8	6.3
culture	0	+	+	+	0
Bottle 4					
acidity	4.4	4.7	5.0	5.2	5.5
culture	0	+	+	+	0

TABLE IV.

VIABILITY OF *B. TYPHOSUS* IN BUTTERMILK.

	Nov. 26	Nov. 27	Nov. 28	Nov. 30	Dec. 1	Remarks
Bottle 1						
acidity	4.5	4.7	4.8	4.5	4.4	
culture	0	+	0	0	0	
Bottle 2						
acidity	4.2	4.2	4.2	4.2	4.2	
culture	0	0	0	0	0	
Bottle 3						
acidity	3.4	3.8	3.8	4.2	5.0	Slight contamination, Nov. 30
culture	0	+	0	0	0	
Bottle 4						
acidity	3.1	3.7	4.3	4.6	4.6	Slight contamination, Nov. 30
culture	0	+	0	0	0	

Finally, the test with buttermilk was repeated and the results of the last test, using four separate bottles, are shown in Table IV.

DISCUSSION.

Table I shows the effects of acidity as such on the multiplication and survival of *B. typhosus*, *paratyphosus*, and *dysenteriæ* (Flexner) in milk. Few contaminating organisms which grew on aerobic plates of brilliant green agar or Endo appeared to complicate the result. With an acidity represented by about 4.0 cc. of N/10 NaOH, the typhoid and paratyphoid bacilli disappear. The dysentery baccilli are more sensitive, disappearing one day earlier than the others. Table II is somewhat more complicated because it introduces the factor of contaminating organisms which grow on the special media. And yet it is only after an acidity of 4.0 is reached that the latter appear as coincidently *B. typhosus* disappears. It appears, therefore, that the latter were not so much overgrown as destroyed by the degree of acidity. The two tests with buttermilk (Tables III and IV) indicate essentially the same thing. No multiplication, but merely speedy destruction, occurred in the samples of Table IV at the original acidity of 3.8 to 4.7; while in three of the four samples of Table II survival of the bacilli (without multiplication) persisted for two days, during which the acidity changed from the initial 4.3–4.7 to 5.0–6.4.

The tests indicate that *B. typhosus* is sensitive to acidity and is usually destroyed in milk in a short time at about the degree of acidity occurring in fresh buttermilk as obtained in the New York market. Buttermilk would seem to be free of danger as a means of distributing *B. typhosus* or *paratyphosus*, or *B. dysenteriæ* in the ordinary course of events.

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Annual Meeting, A. P. H. A., Chicago, Oct. 14-17.
Come, and Bring a New Member.

AN EFFICIENT STATE HEALTH PROGRAM AGAINST VENEREAL DISEASES.

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Minnesota State Board of Health.

Read before the Conference of State and Provincial Boards of Health, June 5, 1918, at Washington, D. C.

Organization and Budget.

STATE control of venereal diseases should be inaugurated by the creation of a division or a bureau of venereal diseases as a department of the State Board of Health. For such an organization an annual budget of from $30,000 to $40,000 should be provided. Of this fund at least $5,000 should be used for furnishing free arsphenamine (salvarsan).

Personnel.

In planning the personnel of such a department, three distinct fields must be recognized: medical, educational, and social service. There should, therefore, be a director who will head the division, and coördinate its work as a whole, and assume the responsibility for the medical work; an educational worker, who will have charge of all educational work; and a social service worker. It would seem distinctly advantageous to have a director, at least temporarily, who is trained in venereal diseases, as many problems will arise in the administration of the work, the successful solution of which will depend upon this knowledge. It is also essential that in order to competently coördinate the work under him, he should have some knowledge of social hygiene, social service, and public health. He will find it necessary also to familiarize himself with the problem of prostitution, the problem of the feeble-minded, with law enforcement, court procedure, probation work, and reformatory systems. In the present war emergency, in order to properly coöperate with the Army and Navy he must be conversant with the details of their program, and their methods of handling the problem. Under the director, there should be preferably two physicians to act as field epidemiologists. It will be well to have one man and one woman. Both should have a knowledge of venereal diseases, and be trained particularly in the diagnosis of syphilis and gonorrhoea. This point should be emphasized, as the occasion will undoubtedly arise when these physicians will have to undertake examinations, or at least, to direct such examinations. It will be advantageous to have one of the physicians in the departmental headquarters, that he may act as an assistant to the director.

Educational Supervisor.

The person in charge of the educational work should be thoroughly familiar with all phases of social hygiene, and the modern conception of its teaching. I believe this should be undertaken preferably by a woman physician, and if she can bring to the department an intimate knowledge of, and an experience with girls and their problems, it will be of decided value. Obviously she must be able to teach and to do public speaking.

Social Service Worker.

This position should be filled by a woman who has a knowledge, or an experience in social service work as related to venereal diseases. In addition to this it is important that she have at least some knowledge of court and probation work, and the handling of delinquents. The success of her work will depend considerably on her ability to educate the community to its needs. Inasmuch as this field is decidedly less established in most communities, than the others, she will need at least two assistants, and they should be selected with the two different angles of the work in view. One should be trained as a clinic worker, and the approach to the problem from this side. The other should be versed in protective work, and an experience as a police woman would be valuable.

OUTLINE OF PROGRAM.

Under ordinary conditions, a program should be developed gradually, and an effort made to carry the public and physicians along with you a step at a time. In this way several years might well be used in putting an entire program into force. If this were being done I should place diagnostic and treatment facilities first, along with educational propaganda, for the complete program, and legal matters last. But these are war times, and we must get the quickest action possible. Consequently, we must adopt and attempt to put into practice the entire program at one time. In order to do this we must first of all have law. In practically all of the states this can be arranged by rules and regulations of the State Board of Health. Either there is a specific statute permitting the board to list infectious and contagious diseases, and adopt necessary rules and regulations for their control, or the board will have the power of quarantine over these diseases, and they can then declare all venereal disease cases under quarantine as fast as diagnosed, and adopt rules and regulations as to how the quarantine should be carried out in different cases. Many states have been forced to use this latter method. For the most part, the Western Australia law has served as a model, and many states have copied it almost verbatim. Venereal diseases must be reported, and I believe that there is only one way which is satisfactory and worth while, and that is by name and address. Reports of course, to be confidential and preferably direct to the State Board of Health. It would be extremely disagreeable in many cases in small communities for physicians to report to local health officers and besides many times a patient is being treated, and would be reported in a different community than his residence. Consequently, the local health officer where the case was reported, would have no jurisdiction. If the reporting of name is not required in all cases the physician should only be allowed to report by serial number, providing, he assumes the responsibility for that particular case insofar as spreading the infection may be concerned. In any case, if the patient does not remain under treatment, or so conducts himself as to endanger others, his name and address should immediately be required. Provision should be made for the patient having the privilege of changing physicians without being regarded as having stopped treatment. Guardians or parents should be made responsible for treatment of minors.

If possible, treatment should be permitted only by qualified practitioners. This would tend to eliminate osteopaths, chiropractics, christian scientists, and possibly some quacks and druggists.

The sale of nostrums and other remedies for gonorrhoea and syphilis by druggists must be stopped. Merely requiring them to report their sales will not suffice, unless that would automatically place them in a position of prescribing, and so make them liable under the medical practice act. But I do not see how this could be done if the patient selects the remedy. Such a law is very much to be desired, as at least 50 per cent of dispensary cases of gonorrhoea go to druggists first, and lose considerable time, and a valuable opportunity for successful treatment.

The board of health should have adequate power to examine suspected persons. This should include prostitutes, and all those arrested for moral turpitude, and all prisoners and other institutional inmates. It should also have full power of quarantine to be used whenever deemed necessary. Exposing another person to gonorrhoea or syphilis should be made a misdemeanor. Freedom from venereal disease should be one of the conditions placed upon securing a marriage license.

Flexner has stated that a rainy night had more effect upon reducing venereal disease than any efforts at medical regulation of prostitution. This statement hinges upon the making of prostitutes inaccessible. Believing his observation to be proven true, I think that the next important step in our program should be the securing of rigid law enforcement as regards prostitution. I believe that the putting into effect of law enforcement in a community which has been lax, will very rapidly reduce exposures and infections by at least one-half. This statement is practically proven by army statistics which we collected in San Francisco at the time such a program was put into effect. Most communities will have sufficient laws or ordinances to cover this work, but we need to educate the police departments and courts to the needs of this action from the public health standpoint. An energetic and continuous drive should be made by the police departments against all phases of prostitution, including any segregated district, open houses, rooming houses, cheap hotels, and street walking. Such persons when arrested should preferably be held under quarantine as having had contact with a communicable disease, instead of being permitted to secure bail under a charge of vagrancy or disorderly conduct. This not only insures the opportunity for a proper physical examination, but also does away with any question of bail-bond sharks. Agreement should be had with police or municipal judges to continue all such cases until a physical examination is made. If a person is found diseased by the health authorities, necessary isolation or quarantine and treatment should be instituted. If they are not found diseased, arrangements should be made with the courts for drastic jail sentences; fines and suspended sentences should not be tolerated, unless recommended, after proper investigation by the probation officer. This is absolutely necessary in order to get proper repressive effect to reduce prostitution to the minimum required by the War Department.

In caring for this class of patients we must recognize the fact that they are not necessarily hospital patients, but that what is needed is a proper place of detention where expert medical care can be given. We must recognize the fact that many of these cases will finally be detained over a period of several weeks or months, and this is decidedly an impractical thing so far as straight hospital wards are concerned. Therefore, the need for a place of detention, which is neither a hospital nor a jail, becomes at once apparent, and very few communities in this country at the present time are furnishing such a place. Inasmuch as inmates of our city and county jails are essentially a class of people likely to be infected, and the surveys already made indicate not less than 50 per cent are infected, the opportunity should be seized to make examinations and institute treatment of all persons confined in these jails, extending if necessary by quarantine, the time beyond the expiration of their sentence. City and county jails are mentioned particularly as they are more frequently without a medical staff, whereas state prisons are usually more adequately equipped.

In this part of the program the social service work is of very great importance.

It would be within the province of the social service department to see that all prostitutes are carefully examined mentally, in order that the feeble-minded may be registered and properly provided for. Careful sociological investigations should be made, and this record furnished the court to assist it in determining the sentences. Proper follow-up of cases should be instituted after the period of quarantine has expired. In connection with this work a very great responsibility rests upon the social service department, the educating of the community to the needs of proper detention homes for both juvenile and adult delinquents, and to the need of adequate quarters for the feeble-minded. In dealing with a large group of hardened offenders, the need also of a state reformatory for women, and a law which will permit of rather long time, indeterminate sentences to such reformatories, will be made apparent. It will not be possible in a few weeks or months to get such persons physically well, out of vicious habits, and trained in some vocation by which a legitimate living can be made, but it will be possible with an indeterminate sentence in a proper reformatory, in the course of two or three years, to get a large percentage at least of such people into condition where they could at least be placed at work under careful supervision or probation.

In connection with this work, as well as with the step which is to follow, there must be furnished free laboratory service, including Wassermann tests, gonorrhoeal fixation tests, and microscopic examinations of smears. It would be to advantage to have the state board exercise a certain amount of control over all laboratories throughout the state, and require that all postive findings be reported to the board, in order that these reports might be checked up with the reports of cases.

The question of free salvarsan has already been mentioned in connection with the budget. There may arise some question as to the method of its distribution. Inasmuch as we still, unfortunately, have many physicians who are not skilled in giving or using this remedy, I believe the time is not yet ripe for the general distribution of free salvarsan to physicians. I would, therefore, suggest that it be distributed to hospitals and dispensaries which have been placed on the approved list by the board of health, and to local health officers. We must not, however, forget that the important thing is to get patients treated, and to make as much use as possible of this free salvarsan, so that this rule should be followed with reason, and no hesitation should be shown in making exceptions, in order that deserving persons should secure salvarsan.

A large percentage of people are not in a position to pay for expert services. Investigations have demonstrated that unless expert service is rendered patients are not treated to a cure. On the other hand, free hospital and dispensary treatment for venereal diseases is entirely inadequate in most communities of the country. An effort should therefore be made to secure greater facilities along this line. We should not, however, be satisfied simply with securing larger facilities, but we must insist as well that they be efficient. It is, therefore, necessary that some system of approval or licensing should be instituted by the board of health following adoption of certain standards. Such standards should include for the dispensary sufficient room, equipment, and an adequately trained staff. There should be nurses and a social service department to do the necessary follow-up work. The staff should be required to devote sufficient time to inform all new patients of the seriousness and the need of long continued treatment for their disease. A requirement should be made calling for the distribution of approved literature. There is also a large group of people who can afford to pay something for their treatment, but who cannot pay the fees of specialists, and who are employed during the day, making it impossible for them to attend the average clinic. This brings up the decided need in every community for an evening clinic, and this may very well be a pay clinic. A nominal charge of 50 cents or a $1.00 has been demonstrated to be sufficient to make the clinic practically self-supporting. A so-called "advisory clinic" is also a very desirable factor, and there is no reason why this should not be run in connection with the local health department. These dispensaries can also be used as prophylactic stations if advisable. Perhaps the most difficult patient of all to control is the one going to a physician and paying for his or her treatment. Physicians in the past have assumed no responsibility in seeing to it that these patients remain under treatment. Very few have taken the time or trouble to inform the patients of their condition, or of the imperative need of long continued treatment. In fact, many times the reverse has been true, and quick and easy cures have been promised for stated sums of money. In my own experience, men who are otherwise recognized as reputable physicians do not hesitate to adopt such tactics in connection with venereal diseases. A campaign of education must be carried to the medical profession as well as to the laity in order to instill into the profession the public health viewpoint in controlling these diseases. Without doubt, the enforcing of rules and regulations will not only assist materially in securing the necessary coöperation of the medical profession, but it will also have a very great educational value.

I have purposely left the educational field to the last, not because it is the least important, for I believe that it is fundamentally the most important, but because it will be much more time consuming and slower of effect upon reducing venereal diseases than the rest of the work. It should be the prime duty of this department to spread a knowledge of venereal diseases and of the state's program for their control. This should be done by proper newspaper publicity, lectures, pamphlets, exhibits, etc. Lectures should be given to groups of employers and employees, to various men's and women's organizations, and to medical societies. A full line of pamphlets should be issued on sex hygiene. A pamphlet on treatment should be furnished to physicians as well as one containing information and instructions to be given to patients. Placards for use in public comfort stations and other suitable places should be arranged for. Reference should be made on these to local dispensaries and advisory clinics. A carefully planned exhibit and a stereomotorgraph equipped with proper slides will also be very valuable. A definite educational campaign should be waged against quacks and fakers.

The next step in the educational work is directed toward those who in their turn will be teachers, and is not limited in its scope entirely to venereal diseases. Courses should be arranged for in every state university, and in all normal schools. These courses should cover the biology and psychology of sex, sociology, sex hygiene, and venereal diseases. Courses should be given in medical schools with particular reference to the public health side of the problem. Courses should be given to hospital, public health, and school nurses. Under the educational department a course of study on sex education should be planned for parents' and teachers' associations. Communities should be stimulated to the further use of present recreational facilities the need and the part this work plays in stimulating a normal sex life in the young should be emphasized. This is one of the very great needs in rural communities.

I believe that one important detail of the educational work should be giving people to understand that something can be done if exposure has already taken place. This may be called early treatment or prophylaxis, as you will. Its value has been fully demonstrated by the army, of that there can be no question, but there is the question as to how this information should be given. I personally believe that no wide-spread publicity of it should be given, nor should there be any question of going to the extreme of suggesting the sale of a prophylactic package. It should be a proper function for the dispensary or hospital in dealing with individual patients to give out this information.

CONCLUSIONS.

Inasmuch as the call for this work has come directly from the Federal Government, it seems only fair that the Federal Government should provide funds to subsidize the state work on at least a 50-50 basis. This would assist more than anything else in offsetting what I have found to be the biggest stumbling block in the entire program, namely, the securing of proper funds for carrying on the work. If every state which appropriates $30,000 or $40,000 could receive another thirty or forty thousand dollars from the Federal Government, sufficient money would be available so that the estate could in turn subsidize the local communities, or could itself place a number of dispensaries at advantageous points throughout the state. It would be easier then to secure necessary detention hospitals, additional physicians, nurses, social service workers, equipment, etc., which is necessary for the carrying out of the program.

Emphasis should be placed on the educational work, particularly in the medical schools, as the people at large depend upon the physicians for information concerning these diseases, and unfortunately the majority of the medical profession have little idea of the modern conception of sex hygiene, or the public health viewpoint of the problem of prostitution, or venereal diseases. This is due primarily to lack of teaching of these subjects in the medical colleges.

A well-rounded program for combating venereal diseases must take cognizance of every factor which enters into their spread. Just why almost every physician who takes up the discussion of the problem should preface his remarks with the statement that we should be concerned with it only as a medical problem and not with morals, is not quite plain to me. Surely all of us must recognize that at the bottom it is much more of a moral question than anything else. If we could at once do away with sex immorality the days of venereal diseases would be numbered. We know that an attack only from the medical side must fail, just as it has always failed in attempted regulation of prostitution. We cannot do away with venereal diseases until we prevent exposures, we must preach continence using the disease as an argument if you will. Let us do everything that medical science says is good, but let us not hesitate as physicians, and as a profession, to declare ourselves on the moral issues as well.

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Annual Meeting, A. P. H. A., Chicago, Oct. 14-17.

Come, and Bring a New Member.

PROFESSIONAL INSTRUCTION IN PUBLIC HEALTH IN THE UNITED STATES AND CANADA.

EUGENE C. HOWE,
Associate Professor of Hygiene, Wellesley College.

PUBLIC health administration is recognized and practiced in Europe as a specialized profession. In the United States, the prevailing opinion has been that the conventional training in medicine confers an appreciation of the scope of hygiene and public health and develops the knowledge and technique needed by the efficient public health officer. It is, of course, quite true that the problem of relating medicine, personal hygiene, education, vital statistics, sanitary law, and sanitary technique, one with another, in public health practice is more germane to the medical than to any other profession. But the problem is, nevertheless, not one which the average medical practitioner is necessarily fitted to solve.

Now, the great majority of health officers and expert members of boards of health in this country are physicians whose training in public health problems has been that afforded only by the public health courses of the conventional medical curriculum plus that which has come to them later from general experience and reading. A small minority of our health officers, both medical and lay, are graduates of special schools of public health. Upon this sanitary service, as well as upon our general medical service, especially heavy demands are now being made. The time is, therefore, appropriate for a brief and tentative appraisal, at least, of the facilities for professional public health instruction in America.

The questions that naturally present themselves are, (1) what are the centres for specialized instruction and training in public health for the graduate in medicine, or for the layman, leading to a special degree in public health and (2) how extensive and effective are the courses in hygiene and sanitation offered in schools of medicine?

Complete answers to these questions could be given only as a result of actual inspection, and personal investigations, such as form the basis of the report of the Carnegie Foundation on medical education (1910). Meanwhile it is possible to make an approximate summary of the extent of professional public health instruction on the basis of the description of courses of hygiene, sanitation, state medicine, preventive medicine, public health, etc., as they are given in the catalogs of the medical colleges of the country; and on the basis of the subject matter of the catalogs of the special schools of public health.

Requests for catalogs and for any special literature dealing with public health instruction were sent to every medical school in this country and Canada. Eighty-one institutions submitted catalogs. Three replied that the supply was exhausted but that one would be sent at the earliest opportunity. Of the 81, 60 were listed by the Council on Medical Education of the A. M. A. (statement revised to August 1, 1916) in Class A, 12 in class B, 7 in class C, while 2 did not appear in their classification. The totals of the three classes are 69, 19 and 14.

SPECIAL PROFESSIONAL SCHOOLS OF PUBLIC HEALTH.

1. Chicago Hospital College of Medicine. Chicago, Ill. A thirty-six hour course is offered which is said to lead to the degree of Doctor of Public Health. No details are given of the subject matter of the course.

2. Detroit College of Medicine and Surgery. Fifth Year Course in Public Health and Preventive Medicine. (Coeducational.) Detroit, Mich.

Admission requirement: Degree in Medicine.

Length of course: One year.

Synopsis of curriculum: Clin. Wrk.; Milk and Wat. Anal.; Alcohol Determ.; Food Anal.; Bact., diagn. and adv.; Municip. San.; Wat. Sup.; Sew. Disp.; Vent.; Field Wrk.

Thesis: Not required.

Schedule of hours: Not given.

Degree: Master of Public Health.

Degrees first conferred in: 1915.

Number of degrees conferred: 2.

3. Harvard University and Massachusetts Institute of Technology. School of Public Health. (Coeducational.) 240 Longwood Ave., Boston.

Admission requirement: (1)* Two years in approved medical school. (2) Bachelor's degree from approved college or technological school. (3) Experience in public health work plus adequate scientific preparation.

Length of course: (1)* At least one year residence for medical graduates, and graduates of Mass. Inst. of Tech., Department of Biology and Public Health. (2) For others, two or more years.

Synopsis of curriculum: (1)* *For medical graduates.* (a) *Required:* Lab. Technique; Municip. San.; Vital Stat.; Epidemiol. and Pub. H. Prob.; Pers. Hyg.; Prev. Med.; Communic. Dis. (clinics); Princip. of San. Sci. and Pub. H.; Pub. H. Admin. Indust. Hyg. and San. (b) *Elective:* Biol. of Infect. Dis.; Food anal.; Pub. H. Field Wrk.; Wass. Lab.; Soc. Serv.; Pract. H. Admin.

(2) *For others.* (a) *Required:* The above subjects and in addition, Biol.; Vert. Anat.; Embryol. and Histol.; Physiol.; Pathol. (b) *Elective:* Pub. H. Field Wrk.; Wass. Lab.; Food Anal.; Soc. Serv.

Thesis: Required in both (1) and (2).

Schedule of hours: Given.

Degree: Certificate in Public Health.

Degree first conferred: 1914.

Number of graduates: 33.

4. Harvard University Medical School, Department of Preventive Medicine and Hygiene. (Men only.) Boston, Mass. Matriculation requirement and length of course not specified.

Degree: Doctor of Public Health, "corresponding in certain particulars to the Doctorate in Philosophy."

Degree first conferred: 1911.

Number of degrees conferred: 15.

5. Johns Hopkins University. School

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* Where two or more admission requirements, lengths of course, and synopses are indicated, they are to be understood to be alternative, not cumulative.

of Hygiene and Public Health. (Coeducational.) Baltimore, Md.

Admission requirement: (1) Two years work in an approved college; adequate preparation in science. (2) Degree in arts or science or its equivalent; two years in approved medical school; certificates of adequate preparation in medical science.

(3) (a) Degree in medicine from approved school; (b) three years in approved medical school (the latter leading to a combined medical and public health course).

Length of course: (1) Two years. (2) Two years, and a summer term. (3) Two years, or one year additional to medical course, plus a summer term.

Synopsis of curriculum: San. and Admin. Law; Hist. of Hyg. and Epidemol.; Adv. Bact. & Immunol.; Vital Stat.; Chem. Meth. appl. to Hyg.; Animal Nutr.; Physiol. Hyg.; other courses in the Johns Hopkins Medical School.

Thesis: (1) Not mentioned. (2) Required. (3) Not mentioned.

Schedule of hours: Not given. (Complete catalog not yet issued.)

Degrees: (1) Bachelor of Science in Hygiene. (2) Doctor of Science in Hygiene. (3) Doctor of Public Health.

Degrees to be first conferred: 1919.

6. Massachusetts Institute of Technology, Department of Biology and Public Health. (Coeducational.) Cambridge, Mass.

Admission requirement: Entrance examinations.

Length of course: Four years.

Synopsis of curriculum: Math.; Hist.; Lang.; Draw.; Phys.; Chem., fundamental and applied; Biol., its various subdivisions, fundamental and applied; San. and Pub. H. (For details see catalog.)

Thesis: Required.

Schedule of hours: Given.

Degrees: Bachelor of Science (M. S. and Ph. D. offered by the Inst. in Dept. of Biol. and Pub. H.).

Date of graduation of first class in the Department of Biology: 1886.

Number of graduates: B. S., 100, M. S., 11, Ph. D., 1. Of these about 75 are in public health work.

7. New York University. University and Bellevue Hospital College. Special Course in Public Health and Sanitation, offered in response to recommendation (1915) of the Public Health Council of the State of New York, New York City.

Admission requirement: (1) (a) Not specified; (b) medical degree. (2) Not specified. Probably the holding of position as health officer.

Length of course: (1) (a) and (b) two years plus six weeks. (2) Correspondence course plus one week's attendance.

Synopsis of curriculum: (1) (a) and (b). *Six weeks.* Communic. Dis.; Bact.; San. Law; Treat. of Nuis.; Inf. and Ch. Hyg.; Sch. Hyg.; Milk, Food, Wat.; Sew.; Hous. and Indust. Hyg.; Vit. Stat.; Quarantine; Tuberculosis.

Schedule of hours: Given.

Two additional years. Above; plus elective work the exact nature of which is not specified.

(2) Reading course of subjects stated under "Synopsis of curriculum (1)," plus a week's diagnostic bacteriology, and clinical and sanitary inspection.

Degrees: (1) (a) Those who are not graduates in medicine and who do not present a thesis, receive a "Certificate of Efficiency in Public Health" on completing the "two years plus six weeks" course; (b) medical graduates who complete this course and present an acceptable thesis receive the degree of Doctor of Public Health. (2) Not specified.

*Date of graduation of first class:**

*Number of graduates:**

8. Ohio State University. Course in Public Health and Sanitation. (Coeducational.) Columbus, Ohio.

Admission requirement: (1) Bachelor's degree including adequate scientific preparation. (2) Medical degree.

Length of Course: One year.

Synopsis of curriculum: Pers. Hyg.; Pub. H. Admin.; Pub. H. Prob.; Vital and San. Stat.; Communic. Dis.; Pub. H. Eng.; Pub. H. Lab. and Insp. Meth.; Prev. Med.; Indust. Hyg.; Ment. Hyg.; Pub. H. Nurs.; Soc. Serv.

Thesis: Required.

Schedule of hours: Given.

Degree: Master of Science in Public Health.

Degree first conferred in: 1917.

Number of degrees conferred: 3.

9. Queens University. Special course in Public Health. Kingston, Canada.

Admission requirement: (1) Degrees of Bachelor of Science and Doctor of Medicine. (2) Degree in Medicine.

Length and subjects of course: (1) Three mo. in clin. instruct. and Bacteriol.; one week in Milk Test.; six mo. experience as assistant to a medical officer of health. (2) Three mo. in each of the following subjects: San. phys.; San. chem.; Bacteriol. Adv. Hyg. (Sew., Wat., Garb., Disinf., Vital Stat., San. Law, etc.); San. Eng., Clin. Instruct.; six mo. experience as assistant to a medical officer of health.

Thesis: Not required.

Schedule of hours: Not given.

Degree: Diploma of Public Health.

*Date of graduation of first class:**

*Number of graduates:**

10. Syracuse University. College of Medicine. (Coeducational.) Syracuse, N. Y. "Special courses for Health Officers are available." (1916–1917 bulletin.)

11. Tulane University of Louisiana. School of Hygiene and Preventive Medicine. (Coeducational.) New Orleans, La.

Admission requirement: (1) Degree from approved school of medicine or its equivalent. (2) Teacher's certificate.

Length of course: Not longer than three years.

Synopsis of curriculum: (1) (a) For degree of Doctor of Public Health. A. Wat., Food, Air Anal.; Vent.; Light.; Vital Stat.; Sew.; Disinf.; Immun. B. Med. Protozoöl.; Med. Helminthol. and Entomol.; Trop. skin dis.; Clin. and Micro. courses in Trop. med.; Diet and Nutr. Dis.; Water Zoöl. and Bacteriol.; Oral Hyg.

Thesis: Required.

Schedule of hours: Given for B but not for A.

(b) For degree of Diploma in Tropical Medicine and Hygiene. Didactic and practical work in special tropical diseases.

Thesis: Required.

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* No reply to special inquiry on this point.

Schedule of hours: Not given.

Degrees: (1) Doctor of Public Health. (2) Diploma in Tropical Medicine and Hygiene. (3) Certificate of attendance and proficiency in any course. (4) Certificate of attendance and accomplishment with recommendation for public school teacher's certificate in hygiene. (See admission requirement above (2).)

*Degree first conferred in:**

*Number of degrees conferred:**

12. Union University. Albany Medical College. Course for health officers, offered in response to recommendation (1915) of the Public Health Council of the State of N. Y. (Coeducational.) Albany, N. Y.

Admission requirement: Degree in medicine or experience as health officer.

Length of course: (1) Six weeks, (2) Correspondence course plus one week's attendance.

Synopsis of curriculum: (1) Anal. of Air, Soil, Wat., Sew., Mlk., Food; Disinf. and Steril.; Garb. Nuis.; Plumb.; Prev. and Cor. Meas. in Pub. H.; Infect. and Immun.; Diagn.; Vac. and Ser. Therap.; Infect. and Communic. Dis.; Epidemiol.; Carriers; Vital Stat.; Milit. Hyg.; San. Surv. (2) Correspondence course plus one week's resident work.

Thesis: Not required.

Degree: Certificate.

*Date of graduation of first class:**

*Number of graduates:**

13. University of Colorado. Course in Public Health. (Coeducational.) Boulder, Colo.

Admission requirement: Bachelor's degree from approved college.

Length of course: (1) Minimum of two years, one year in residence. (2) Minimum of one year in residence. (3) Four years. Reading course during the regular sessions. Attendance during the summers.

Synopsis of curriculum. A. Prev. Med. group.-Hyg.; Prev. Med.; Epidemiol.; Pub. H. Admin.; Pub. H. Prob.; Pub. H. Field Wrk.; Pub. H. Lab. Meth.; Clin. Lab. and Serol.; Pub. H. Law; Infect. Dis.; Dis. of Animals trans. to man; Human Physiol.; Meth. of Pub. H. Propaganda. B. Biol. and Chem. group.-Human Heredity and Eug.; Princ. of Hered.; Planktonol.; Entomol.; Econ. Bot. and Zoöl.; Med. Entomol.; Wat. Food, and Sew. Anal.; Bacteriol. C. San. Eng. group. D. Soc. Serv. group.

Thesis: Required.

Schedule of hours: Given.

Degrees: (1) Doctor of Public Health. (2) Master of Science in Public Health. (3) Certificate of Public Health.

Degrees first conferred in: 1915.

Number of degrees conferred: Master of Science in Public Health, 1.

14. L'Université Laval. L'École de Médecine et de Chirurgie. Cours Spécial d'Hygiène Pratique. Montreal, Canada.

Admission requirement: Degree in medicine.

Length of Course: One year.

Synopsis of curriculum: Princ. of Hyg.; Practical Duties of the Health Officer; Bacteriol.; Chem.

Thesis: Not required.

Schedule of hours: Not given.

Degree: Diploma of Public Hygiene.

Degree first conferred in: 1912.

Number of degrees conferred: 21.

15. University of Michigan. Grad-

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* No reply to special inquiry on this point.

uate School. (Coeducational.) Ann Arbor, Mich.

Admission requirement: Bachelor's or medical degree.

Length of course: At least on year for master's degree.

Synopsis of curriculum: (For master's degree.) Pub. Wat. Suppl.; Wat. Purif.; Sew.; Str. Clean.; Garb. Disp.; Gen. Hyg.; Wat. Anal.; Food Anal.; Gen. Bacteriol.; Pract. Bacteriol.; Pathogen. Protozoöl.

Thesis: For master's degree, not required. For doctor's degree, required.

Schedule of hours: Given.

Degrees: Master of Science in Public Health, Doctor of Public Health.

Degree first conferred in: 1914.

Number of degrees conferred: Master of Science in Public Health, 10; Doctor of Public Health, 4.

16. University of Pennsylvania. Graduate School of Medicine. Courses in Public Hygiene. (Coeducational.) Philadelphia, Pa.

Admission requirement: (1) Medical degree plus adequate pre-medical scientific training. (2) For lay entrants no requirements are stated.

Length of course: One year.

Synopsis of Curriculum: San. Engin.; Food Inspect.; Pract. San. Meth.; Bacteriol.; Protozoöl; Arthropods and Dis.; Helminthol.; Trop. Dis.; Med. Inspect. of Sch.; Pers. Hyg.; Vital Stat.; San. Law; Gen. Hyg.; Indus. Hyg.

Thesis: Not mentioned.

Schedule of hours: Not given.

Degrees: (1) Doctor of Public Hygiene. (2) Certified Sanitarian.

Degree first conferred in: 1912.

Number of degrees conferred: Doctor of Public Health, 29; Certified Sanitarian, 3.

17. University of Toronto. Faculty of Medicine. Curriculum for the Diploma of Public Health. (Coeducational.) Toronto, Canada.

Admission requirement: Medical degree from approved school.

Length of course: One winter and one summer session.

Synopsis of curriculum: San. Chem.; Bacteriol.; Parasitol.; Gen. Hyg.; Pathol.; Geol.; Meteorol.; Climatol.; San. Eng.; San. Law; Vital Stat.; Contag. Dis.; Hist. of Prev. Med. and Epidemiol.

Thesis: Not required.

Schedule of hours: Not given.

Degree: Diploma in Public Health.

Degree first conferred in: 1911.

Number of degrees conferred: 12.

18. University of Wisconsin. Medical School. Special Courses in Public Health. (Coeducational.) Madison, Wis.

Admission requirement: Degree in medicine or in medical or sanitary science.

Length of course: (1) One year. (2) One year plus advanced work and thesis.

Synopsis of curriculum: Bacteriol. for Health Officers; Spec. Pathol. and Hyg. for Health Officers; Pub. H. Admin. and Vital Stat.; Chem. of Wat. Suppl.; Physiol. for Health Officers; Pub. San.; Pract. Field Wrk.

Thesis: Required for the Doctor's degree.

Schedule of hours: Not given.

Degrees: (1) Master of Public Health. (2) Doctor of Public Health.

Degree first conferred in: 1918.

Number of degrees conferred: Master of Public Health, 4; Doctor of Public Health, 2.

19. Western University. Institute of Public Health. London, Canada.

Admission requirement: Not stated.

Length of course: Not stated.

Synopsis of curriculum: Not given.

Degree: Doctor of Public Health.

20. Yale University. Sheffield Scientific School and Yale School of Medicine. Course leading to Certificate in Public Health. (Coeducational.) New Haven, Conn.

Admission requirement: (1) Degree in science, arts, or medicine. (2) Experience in public health work (to be accepted at the discretion of committee).

Length of course: One year.

Synopsis of curriculum: Courses have not yet been described in the printed catalog.

Degree: Certificate in Public Health.

Degree first conferred in: 1918.

Number of degrees conferred: 2.

The purpose of this outline is not critical. One comment may be permitted, however, on the striking lack of uniformity in degrees and certificates granted and in the requirements for graduation. In this connection an examination of a summary of public health instruction in England given in *The Lancet* August 25, 1917, p. 326, affords an interesting comparison with such instruction in America.

COURSES IN HYGIENE IN REGULAR MEDICAL CURRICULA.

The points noted in regard to the courses in hygiene (alternative titles—public health, preventive medicine, sanitation, etc.) in the regular medical curricula are as follows:

NUMBER OF HOURS OF INSTRUCTION IN HYGIENE.

Number of Hours	Class A	Class B	Class C	Not classified
(1) Not determinable from catalog, or (2) Courses not required, or (3) None given.	5	2	3	1
10–18 (Lectures)	6	0	0	0
32 (Lectures)	18	4	0	0
36–75 (Lectures)	14	5	3	1
80–180 (Lectures)	5	0	0	0
Various combinations of lectures and laboratory: 0–94 (Lectures,) 12–64 (Laboratory)	12	1	1	0

YEAR OR YEARS IN WHICH HYGIENE IS GIVEN.

Year (medical)	Class A	Class B	Class C	Not classified
1	1	0	1	0
2	18	2	0	0
3	14	0	1	1
4	15	5	3	0
2–3	3	0	0	0
2–4	2	0	0	0
3–4	4	0	0	0

COURSE IN HYGIENE AN INDEPENDENT DEPARTMENT.

	Class A	Class B	Class C	Unclassified
Given independently	41	4	6	1
Combined with other subjects	16	5	0	0

The subjects to which hygiene and sanitation are frequently appended are pathology, bacteriology, therapeutics, medicine, clinical microscopy, histology.

When descriptions of the courses are given at all they are often found to be very elaborate. In one instance the following subjects are said to be treated in a one year, two hour course—personal, domestic, and public hygiene; sewage disposal; dairies; milk handling; diseases arising from dust, gases, extremes of heat and cold, metals, and chemicals; food poisons; methods of prophylaxis; disinfection of excreta, rooms and habitations; laws of quarantine and isolation; demography and vital statistics; children's diseases; school hygiene; ventilation of homes and factories; problems based on actual occurrences, in the detection of sources of epidemics and of chemical poisoning.

When text-books and references are named, they consist, almost without exception, of a few conservative compendiums of the whole field of hygiene and sanitation. There is scarcely an instance of citation of any up-to date monographs on personal hygiene, public health administration, sewage disposal, water supply, milk supply, epidemiology, ventilation, etc. There are no instances of reference to text books or periodical literature in the foreign languages which are so generally required for entrance into medical schools.

Such are the approximate indications, of the extent of training in hygiene and sanitation received by students in medicine—upon all of whom, in their private practice, progress in sanitation and in the education of the people toward conscientious, coöperative protection of the public health should in large measure depend and upon many of whom will devolve the duties of the health officer and of the expert member of the Board of Health.

Perfect accuracy is not claimed for the above summaries. The composition of the average catalog—often without table of contents, index, or both, the subject matter unpredictably arranged, course and department headings often coördinate in size and position on the page—makes it impossible to say without a complete reading that some pertinent item has not been omitted.

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Annual Meeting, A. P. H. A., Chicago. Oct. 14-17.

Come, and Bring a New Member.

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THE HEALTH BULLETIN.

Inquiry was recently made among state health departments concerning monthly health bulletins. Of thirty states which replied, only eighteen issue monthly publications. The median circulation of these is about 11,000 monthly. North Carolina reports 48,000, Virginia 40,000 and New York State, 20,000. Louisiana reports the extraordinary circulation of 240,000.

An analysis of mailing lists is highly important both for the purpose of shaping editorial policy and of reducing waste. About half of the states automatically place all local health officers and board of health members upon the mailing list; presumably the other states demand a specific request. A smaller number include practising physicians, mayors, and school teachers without request.

A surprisingly small proportion of the readers is composed of health officials—only about 5 per cent. Practising physicians make up 40 per cent, teachers, and social workers, etc., about 15 per cent. If these figures are true, then the appeal of the state health bulletin should by no means be limited to the local health officer. For example, one bulletin editor found that about two-thirds of his printing bill was devoted to the publication of statistical tables, whose interest to the reader he greatly questioned. As tabular matter costs from two to six times as much to set up as straight matter, he concluded that by eliminating some of the tables, he could produce a bulletin far more acceptable to his readers, while at the same time saving money for other necessary activities. It is, of course, not to be advocated that all tabular matter be discarded; for in large population groups, publication of fundamental statistics in uniform style is very useful for study purposes.

Apparently, no state health bulletins bear a subscription charge. Recently, however, the New York City *Bulletin* instituted a charge of ten cents per year, in order to retain second-class postal privileges. As a result, the circulation dropped from 14,000 to 6,000. That the drop was no greater is really a compliment to the *Bulletin;* many others would not have fared so well. We may seriously ask whether the 6,000 faithful who have paid their dimes will not derive a greater total benefit than the original 14,000, for it is well known that a gift is rarely as well appreciated as a purchase. Possibly every bulletin should require some kind of effort from the reader, such as annual filling out and paying postage upon a request to be kept upon the mailing list. This will also eliminate deadwood.*

Your Health, of the Cleveland Health Division, has recently begun to charge fifty cents per year. It will be interesting to learn the outcome of the experiment. Incidentally, this bulletin illustrates forcibly how the mechanical make-up alone can enhance attractiveness. The health bulletin has tremendous competition to meet in getting itself read, and judicious selection of design, type, and paper will often save it from the waste-basket.

DELAWARE SETS AN EXAMPLE.

Mr. C. H. Wells, for thirteen years Health Officer of Montclair, N. J., has been appointed State Health Commissioner of Delaware.

The announcement has a double interest. First, the State of Delaware goes beyond its borders for a health officer, whilst many states still insist upon home talent—often at the expense of efficiency.

But—what is more striking—Delaware is to our best knowledge the first state to select a non-medical state health commissioner. True it is that recent straws in the wind have indicated a trend of sentiment on the question. Non-medical men of public health training are now district health officers in California, Maine, and probably elsewhere. Mr. James E. Bauman is for the second time Acting State Health Commissioner of Ohio. The Medical Department of the Army has commissioned non-medical sanitarians. But perhaps the most authoritative sanction of the new viewpoint was the indorsement of the Public Health Service Reserve Bill by the Conference of State and Provincial Boards of Health of America, the Council of National Defense and the Surgeon General of the United States Public Health Service. This bill proposed to make qualified public health men eligible to the rank of Sanitarian, equivalent to that of Surgeon of the Public Health Service.

Many states—probably the majority—still require that the health officer be a "physician legally entitled to practice medicine in this State." In the interest of efficiency, state health officers should urge the repeal of this requirement and the substitution therefor of training in public health.

If you need a watch-dog and set out to find one, your task need not be difficult. But if you specify a beautiful watch-dog, of noble ancestry, fond of children, who possesses a crooked tail, you may not be able to find your dog at all.

So it is with health officers. It is recognized that medical training is highly useful; indeed, in some positions in public health work, it is indispensable. In general, however, the real essentials for a health officer are fitness for public life, executive ability and especially training in preventive, not curative, medicine.

FOR ASSOCIATION MEMBERS.

In the July issue of the JOURNAL appeared an account of the Chicago meeting of the Board of Directors. Several important policies were adopted of interest to every member of the Association. If the item escaped your attention turn to page 530 of the July issue, and read.

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* About 15 per cent of a general mailing list becomes incorrect each year.

TYPHOID FEVER:* ITS NATURE, MODE OF SPREADING, AND PREVENTION.

WILLIAM BUDD, M. D., F. R. S.,
(*Published in 1873.*)

There are few things which concern the people of this country more deeply than to know the exact truth touching the mode in which this fatal fever is disseminated amongst them. Every year, on an average—take the United Kingdom through—some fifteen thousand or more of their number perish prematurely by it: a population equal to that of a considerable city every year swept into the grave by a single, and, as I hope to show, a perfectly preventable plague.

Perhaps there are few battles to be fought, in which a successful issue depends so closely as here on a real knowledge of the enemy. That typhoid fever is a true member of this group, or in other words, that it is, in its essence, a contagious or self-propagating fever, was proved long ago. It is scarcely to the credit of the medical profession that this great truth should be still disputed. But, not withstanding this, there is abundant reason to believe that, in respect of this species of fever, the great majority, not of the laity only, but of the profession also, still remain anti-contagionists. And this, moreover, is not only true of the rank and file, but distinguished men, who have gained great credit and wide acceptance as teachers of medical science, are to be found, who appear to lean to the same side.

For the development of this fever a more specific element was needed than either the swine, the dung-heaps, or the privies were, in the common course of things, able to furnish.

In the course of time, as was, indeed, pretty sure to happen, this element was added, and it was then found that the conditions which had been without power to *generate* fever, had but too great power in promoting its spread when once the germ of fever had been introduced.

On the 11th July, 1839, a first case of typhoid fever occurred in a poor and crowded dwelling. Before the beginning of November, in the same year, more than eighty of the inhabitants had suffered from it under my care.

Now I need scarcely add, that of the various properties that can be shown to belong to any given malady, this one, of all others, is incomparably the most important. In the first place, it is clear that, in a far higher sense than can possibly attach to any other conceivable property, this mode of propagation sets upon a disease the stamp of a specific nature. In order to appreciate its full significance in this respect, we must not forget that, like the other contagious fevers, this fever, in particular, not only propagates itself, but, if common observation can be trusted in such a matter, propagates no other kind.

What we actually *see* in smallpox—in the typical member of the group—is but a picture of what occurs in the rest. In typhoid fever, as in smallpox, it is the act of growth (with all that is incident to it) that kills; that constitutes the disease, in fact; and where the conditions for this growth are wanting, the poison is powerless. Whether in this fever the scale of reproduction be as vast as in smallpox, we have not the same ocular means of judging; but that it is the same in kind, and immense in degree, the whole history and evolution of the disorder proves.

The living human body, therefore, is the soil in which this specific poison breeds and multiplies; and that most specific of processes which constitutes the fever itself is the process by which the multiplication is effected.

This is what contagion in typhoid fever really implies, and it is thus that provision is made for the perpetuation of the malady.

Now, I have no difficulty in at once giving my opinion that *all* the emanations from the sick are in a certain degree infectious. At the same time, it is one of the principal objects of this work to show that what is cast off from the intestine is incomparably more virulent than anything else.

These discharges contain matters on which the fever poison has set its seal in the most consummate fashion. Wherever they travel—wherever their exhalations penetrate—there, at least, the most specific of all the exuviæ from the sick body are in operation. The sewer, which is their common receptacle, is, so to speak, the direct continuation of the diseased intestine.

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* This is the second of a series of extracts from classic public health literature selected by Prof. C. M. Hilliard.

Take the diseased intestine away, and it becomes impossible, in a common outward survey, at least, to distinguish the body of a man dead of typhoid fever, from that of a man killed by many another septic poison; take away the body, but leave the intestine and by the marks upon it, death from this fever is, at once distinguished from death from every other cause.

The second great point to which, before I conclude this chapter, I wish for the moment to draw attention, is, that the excreta to which all these fatal prerogatives are assigned, are on their issue from the body, entirely within our power. I shall show, in the course of these pages, that by placing a sufficient measure of a caustic solution of chloride of zinc, or an equivalent quantity of any other powerful disinfectant in the night-pan before it is used by the fever patient, the intestinal discharges may be entirely deprived of their contagious powers.

To insure the universal adoption of a measure even so simple as this, would, however, require a degree of coöperation amongst medical men, and a degree of zeal and intelligence on the part of attendants of the sick, which at present, at least, I fear we have no title to expect. At present, the great bulk of what escapes from the intestines of fever patients in this and other countries, is, too often, let loose upon society without the slightest precaution being taken, and we see with what results. I trust the time is not far distant when to allow these matters to pass into the cesspool or sewer in full possession of their deadly powers will be looked upon, not merely as a careless but as a highly culpable act.

One mode of communication has attracted little attention, which it is important, nevertheless, not to overlook; I speak of the tainted hands of those who wait on the sick. Among the poor, and in ways that will suggest themselves, and need not be more particularly described, there is reason to believe that this mode often has a large share in spreading the disease through the family circle. Passing from the hands to other things under contingencies that are not only very conceivable, but are sure now and then to occur, the contagion thus arising may sometimes have a much wider scope. I possess evidence which renders it in the highest degree probable, that milk and butter, especially, may become infected in this way.

Linen, wearing apparel, bedding, and other porous fabrics, tainted with fever, constitute another important form of vehicle. But the propagation of typhoid fever on a large scale, and down through the ages, is effected through other media. We have already seen that the bulk of the poison by which the succession is kept up, is cast off by the intestine in a liquid form. The first effect is, therefore, as I have before said to infect the ground.

Obviously, there are two *principal* ways, and only two, in which a poison cast out upon the ground can find its way back again into the living organism. Either through the drinking water, or by emanations borne upon the air.

In the course of this work, I have already had occasion to speak of disinfection as the one great means whereby the spread of typhoid fever may be prevented.

In carrying out this system of prevention, two great principles should be kept in view. The first is to be lavish in the use of the chemicals rather than to run the terrible risk of failing by default; the second, that whatever be done should be done in that thorough and conscientious way which alone befits acts that may issue in health or disease, in life or death, to indefinite numbers of men. But no preventive scheme would be complete which did not provide against those in which the fever remains, for a longer or shorter time, undetected. I have already shown how the occurrence in school-children of that type of fever, which the French call *la fiévre typhoïde ambulante,* may become the means of spreading the disease widely through a school, and thence through a large community.

Of the permanent sanitary works, by which the spread of typhoid fever may be hindered, this is not the place to speak. The business of designing and executing these works belongs not to the physician, but to the engineer. Their chief object is to prevent the drinking water, as well as the air of the inhabited area, from becoming contaminated by human excreta. As regards the water, we know how this may be effected, and the question is one of expense only. But as regards the air, great improvements must be made in our systems of drainage to enable us safely to dispense with the disinfecting measures detailed in the present chapter.

The need of some radical modification in the view commonly taken of the relation which subsists between typhoid fever and sewage was placed in a very striking light by the state of the public health in London, during the hot months of 1858 and 1859, when the Thames stank so badly.

The results we all know. Stench so foul, we may well believe, had never before ascended to pollute this lower air. Never before, at least, had a stink risen to the height of an historic event. Even ancient fable failed to furnish figures adequate to convey a conception of its thrice Augean foulness. For many weeks, the atmosphere of Parlimentary committee-rooms was only rendered barely tolerable by the suspension before every window of blinds saturated with chloride of lime, and by the lavish use of this and other disinfectants. More than once, in spite of similar precautions, the law-courts were suddenly broken up by an insupportable invasion of noxious vapour. The river steamers lost their accustomed traffic, and travelers, pressed for time, often made a circuit of many miles rather than cross one of the city bridges.

With the popular views as to the connection between epidemic disease and putrescent gases, this state of things naturally gave rise to the worst forebodings. Members of Parliament and noble lords, dabblers in sanitary science, vied with professional sanitarians in predicting pestilence. If London should happen to be spared the cholera, decimation by fever was, at least, a certainty. Meanwhile, the hot weather passed away; the returns of sickness and mortality were made up, and, strange to relate, the results showed, not only a death-rate below the average, but, *as the leading peculiarity of the season,* a remarkable diminution in the prevalence of fever, diarrhea, and the other forms of disease commonly ascribed to putrid emanations. So that, while pythogenic compounds were poisoning the air with what may be called a forty thousand fever-power, the so-called pythogenic fever, so far from rising in proportion, fell much below its average.

While, therefore, the great fact remains that sewers are the principal channels through which this fever is propagated, the proof from all sides is overwhelming that they are so not because of their being receptacles of decomposing organic matter, but solely to their being the depositaries of the specific discharges of persons already infected.

The theory, in its entirety, is not only simple and harmonious, but it is in strict accordance with what we already know of a certainty of other members of the same family group.

Above all, its truth may be tested every day by a practical test, the employment of which can do no harm, and may do incalculable good.

Here I might fitly conclude. With this last step, as all may see—Science passes into Duty.

C. M. H.

ASSOCIATION NEWS

By the Secretary, A. W. Hedrich.

HELP WANTED.

In order to help relieve the shortage of sanitarians due to the war, free help-wanted announcements will be carried in this column until further notice. Copy goes to the printer on the first of each month. In answering keyed advertisements, please mail replies separately.

The Health Employment Bureau also sends lists of applicants to prospective employers without charge.

Wanted: A woman bacteriologist, or a man who is not subject to draft, to carry on research work in bacteriology on the flora of the mouth and study of a formula for dentifrice, with a Connecticut company. Address No. 143, C. K. T., care of this Journal.

Wanted: Professor of bacteriology and pathology in a western university and ex-officio director of state public health laboratories. Should be M. D. or D. P. H. Salary, $3,000 per year with prospects of advance. Address No. 144, F. E. H., care of this Journal.

Wanted: Assistants in public health work in western state to take charge of branch laboratory and to help in main laboratory. Salary, $1,800 per year. Address No. 145, F. E. H., care of this JOURNAL.

Wanted: Sanitary bacteriologists in West Virginia Government plant. Salary, $150 per month with quarters. Address No. 146, W. A. J., care of this JOURNAL.

Wanted: Acting director for Virginia public health school. Should have training or experience with social work and public health work; be a good organizer, and have some ability in publicity as applied to securing students. Salary, $2,400 per year. Address No. 147, H. H. H., care of this JOURNAL.

Wanted: Physicians to look after health and medical departments of large industrial plants. Address No. 148, P. E R., care of this JOURNAL,

Wanted: Health officer in New Jersey city. Salary, $2,400 to $3,000 per year. Address No. 149, W. H. C., care of this JOURNAL.

Wanted: Chemist and bacteriologist in an Indiana public health laboratory. Man or woman. Water, milk, and food analysis and microscopical diagnosis of common communicable diseases. Address No. 150, O. G. H., care of this JOURNAL.

Wanted: Bacteriologist in Middle West to take charge of State Laboratory of Hygiene. Medical degree preferred. Address No. 151, S. D. W., care of this JOURNAL.

Wanted: Competent water analysts to take up chemical and bacteriological work with water purification plant. College graduate required. Salary depends on experience of applicant. Address No. 152, H. E. G., care of this JOURNAL.

Wanted: A public health field secretary. A man of agreeable personality and of ability to organize will find stimulating work and a future. Salary, $3,000 to $5,000 per year. In replying give briefly age, education, experience, and references. Address No. 153, H. W. A., care of this JOURNAL.

The Sanitary Corps of the Army Medical Department is in need of men for the following sanitary work: design and operation of water purification plants; sewage disposal plants and garbage disposal plants; malarial drainage work; eradication of mosquito and flies; construction of drainage ditches, incinerators, latrines, waste water pits and routine inspection work. For this work men holding Doctor of Public Health and Certificate of Public Health degrees, sanitary engineers, and water and sewage chemists and bacteriologists are desired. Address William D. Wrightson, Lt. Col., Sanitary Corps, N. A., Washington, D. C.

Wanted: Full-time health officer in Iowa city, near large cantonment. Should be thoroughly trained in public health work. Salary, $3,000 with probable increase if satisfactory. Address No. 154, D. F. T., care of this JOURNAL.

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New Members Elected.—The following were elected to membership in the Association, during July 1918:

E. G. Steele, M. D., Plentywood, Mont., Physician.

Robert Selden, M. D., Catskill, N. Y., Physician.

G. E. Marquis, Quebec, Canada, Provincial Statistician.

Oswald M. Gruhzit, Flint, Mich., Bacteriologist and Chemist.

Charles C. Wallin, M. D. Lewiston, Mont., Physician.

W. C. Matthews, M. D., Butte, Mont., Physician.

City Board of Health, Belt, Mont.

A. R. Varco, M. D., Miles City, Mont., Physician.

County Health Officer, Roundup, Mont.

Cascade County Board of Health, Great Falls, Mont.

George D. Finlayson, Ottawa, Ontario, Superintendent of Insurance.

The Policy-Holders' Mutual Life Insurance Co., Toronto, Ont. (Corporate).

Charles Guy Eldredge, Ft. Worth, Texas, Water Purification Chemist.

Arthur H. McCray, Helena, Mont., State Bacteriologist.

Leonard Greenburg, New Haven, Conn., Sanitary Engineer.

Wm. Bradford Buck, Paris, France, Superintendent of Hospitals, Bureau of Tuberculosis American Red Cross.

Ralph Smith Dewey, Kent, Ohio, Chemist, Akron City Water Works.

Joseph James Gerkins, M. D., Ironwood, Mich., Health Officer.

Illinois Life Insurance Co., Chicago, Ill. (Corporate).

Federal Life Insurance Co., Chicago, Ill. (Corporate).

Sien-Ming Woo, Shanghai, China, Associate Secretary, Joint Council on Public Health Education, China.

Otis B. Nesbit, M. D., Gary, Indiana, Medical Inspector, Public Schools.

Penn Mutual Life Insurance Co., Philadelphia, Pa. (Corporate).

Thomas Jefferson Mahaffy, Jacksonville, Fla., Veterinarian.

Frederick C. Liddle, M. D., Dorset, Vt., Physician.

Joseph P. Newton, M. D. Benson, Vt., Health Officer.

John G. Du Pins, M. D., Lemon City, Fla., Surgeon and Physician.

J. W. Estabrook, M. D., Brandon, Vt., Health Officer.

H. C. Babcock, M. D., Miami, Fla., Physician and Surgeon.

H. W. Slocumb, Burlington, Vt., Executive Secretary, Association for Prevention of Tuberculosis.

Homer D. Venters, State Laboratory, Tampa, Fla., Bacteriologist.

John J. Wenner, C. P. H., Ph.D., Yale Post Office, New Haven, Conn., Training in Bacteriology and Public Health.

G. C. Whitehill, Groton, Vt., Health Officer.

Reed R. James, Des Moines, Iowa., Executive Secretary, Iowa Tuberculosis Association.

Howard J. Sankey, M. D., Jasper, Ala., Physician.

Josephine D. Pfeifer, D. D. S., Chicago, Ill., Dentist.

Glodden W. Baker, State Department of Health, Albany, N. Y., Statistician.

Wm. C. Bridges, Columbus, Ga., Bacteriologist and Dentist.

Albert R. Hurley, M. D., East Rochester, N. Y., Health Officer.

Barton T. McDowell, N. D., Centre, N. Y., Physician.

Elizabeth Burr Thelberg, M. D., Poughkeepsie, N. Y., professor of Physiology, Hygiene and Resident Physician.

James Maguire Landry, A. B., A. M., Akron, Ohio., Director of Division of Laboratories.

Russ. W. Harding, Franklin, Mass., Health Agent, Fidelity Mutual Life Insurance Company, Philadelphia, Pa.

James H. Randolph, A. B., M. D., Jacksonville, Fla., Practice of Medicine.

Mary Freeman, M. D., Perrine, Fla., Physician.

PUBLIC HEALTH NOTES

Abstracts by M. P. Horowitz and David Greenberg.

Production of Milk of Low Bacterial Count.—In Bulletin No. 642 U. S. Dept of Agriculture, the factors concerned in the production of milk which is practically free from visible dirt and which has a low bacterial count have been carefully investigated. The results of the experiments indicate that it is possible for the average dairyman on the average farm, without expensive barns and equipment, to produce milk (practically free from visible dirt) which when fresh has a low bacterial count. By the use of the three simple factors, namely, sterilized utensils, clean cows with clean udders and teats, and the small-top pail, it should be possible on the average farm to produce milk which corresponds closely to milk as it leaves the udder of the cow. A fourth factor, of holding milk as near 10° C. (50° F). as possible, is also absolutely necessary. (*D. G.*)

The Housing of Munition Workers.—Otto M. Eidlitz who is in charge of the Bureau of Industrial Housing and Transportation for the United States Department of Labor, describes in *American City* for June 1918, the procedure employed for housing munition workers. The plan resolves itself into three parts, namely, a study of the available housing facilities, and rooms about the plant; a study of the transportation facilities, schedules, and available homes in the suburbs; and lastly, a plan for adding new homes, apartments and dormitories, to those already available. In all cases, it is aimed to avoid overcrowding, the lowering of moral standards, and the introduction of unsanitary conditions and other housing evils. (*M. P. H.*)

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Sanatorium Treatment of Tuberculosis.—Analysis of the cases of tuberculosis at the King

Edward VII Sanatorium over a period of 11 years arranged in Groups 1, 2, and 3 as defined by the Turban-Gerhardt classification, which on admission had Tbc. in the sputum may be thus summarized:

Of 318 T. B. + cases in Group 1 discharged during the 11 years under consideration, 138 or 43.3 per cent, had a negative sputum when they left the sanatorium.

Of 1011 T. B. + cases classified in Group 2,227, or 22.4 per cent, were discharged with T. B. no longer to be demonstrated in the sputum.

Of 703 T. B. + cases classified in Group 3 the disappearance of the bacilli from the sputum was obtained in 32 only, or less than 5 per cent.

The records of loss of T. B. (43.3 per cent) for cases in Group 1 are satisfactory evidence of the value of sanatorium treatment in the initial stages of the disease. The relatively poor results obtained among the large, and therefore the more important, group of moderately advanced (Group 2) suggest that for this class of patient an average of some 4 to 6 months' treatment is inadequate.

As to the value of tuberculin treatment the percentage figures for the two years during which tuberculin was so largely used—namely, 1912–1913 and 1913–1914, are practically the same as the records for two years subsequently to this period—namely, 1915–1916 and 1916–1917, during which tuberculin was not employed at all.—*Lancet*, June 22, 1918, p. 872.

(*D. G.*)

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Proper Nutrition and Health Education.—In the *Survey* for June 1, 1918, C. W. Uzzell describes a method employed in correcting undernourishment in school children in New York City. Each child is first examined physically, and a growth chart plotted. The child is then impressed with the significance of the chart, and told how to vary the diet sufficiently to bring about an improvement. It is found, that as a rule, the diet is satisfactory except from the point of view of quantity. This can generally be corrected by adding a cereal to the diet. Coincident with education along these lines, and home visits, the child is treated for tonsils or adenoids if necessary, and duly impressed with the necessity for plenty of fresh air and sufficient rest. Children who graduate from the undernourished class are awarded a diploma. It is maintained that this form of health education must become a regular part of the curriculum, just as reading and arithmetic are today. (*M. P. H.*)

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Tuberculosis Survey of Saranac Lake.—The more interesting results of this very comprehensive survey of Saranac Lake (a health resort for tuberculosis patients) are:

1. Indigenous morbidity and mortality from tuberculosis were low; but 0.3 of 1 per cent of living cases being found among the native born and 0.9 of 1 per cent among previously healthy residents, a result which is in accord with investigations elsewhere and the conclusion seems justified that there is a minimum of danger of infection of healthy adult residents of resorts frequented by tuberculous patients.

2. A total of 61 per cent of negative family histories was obtained. This would indicate that sources of infection are widespread and absence of direct family history by no means presupposes freedom from adult manifestation of clinical disease.

3. In families with both parents tuberculous there is more clinical tuberculosis in the children than if only one parent is tuberculous. Incident morbidity is very low among children in the health district.—*Amer. Rev. for Tuberculosis*, II, No. 4, p. 207. (*D. G.*)

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Findings of the Framingham Tuberculosis Demonstration.—The canvass for existing illness (including minor illnesses) was made and a sickness rate of 6.2 per cent was recorded and when the definition of illness is restricted so as to include only incapacitating affections, the sickness rate drops to only 1.8 per cent. A classification of the affections discovered as to their preventability, placed 57 per cent in the entirely preventable class. The preventable and doubtfully preventable groups combined, constituted 84 per cent of the total, leaving an entirely non-preventable group of 16 per cent. A von Pirquet tuberculosis survey of children (ages 1–7 years), supplemented by medical examinations, showed for males 32 per cent positive and for females 35 per cent. On the basis of the number of cases disclosed by the examinations it is estimated that there are in the community, 19 cases for every death, including arrested cases, and about 10 cases for every death when active cases alone are considered.—*Amer. Rev. of Tuberculosis*, II, No. 4, p. 195. (*D. G.*)

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War Causes Anti-Mosquito Work.—Because of the large concentration of sailors and soldiers from all parts of the country, both at the Harvard Radio School, and the Massachusetts Institute of Technology, a Sanitary Commission has been organized in Cambridge, Mass., to eradicate all mosquito-breeding places. It is known that many of the men who have come from the south have had malaria, and that the anopheles mosquito is found in Cambridge. The campaign is supported and encouraged by such men as Dr. Charles W. Eliot, President A. L. Lowell of Harvard, President R. C. Maclaurin of Technology, Professor G. C. Whipple, the Cambridge officials and the naval and military commanders. The following methods of mosquito eradication will be practiced: drainage, filling in, oiling, smoothing of banks and rough spots of streams, and screening of standing bodies of water as those found in water towers, etc. The work will be in charge of M. C. Balfour of Technology.—*The Tech*, June 19, 1918. (*M. P. H.*)

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Control of Water Supply.—In the twelfth annual report to the Metropolitan Water Board, Dr. A. C. Houston points out that better results as judged by the *B. coli* test, can be obtained by chlorination than by storage of water. The dose of chlorine was usually 0.5 parts per million. In respect of economy, chlorination has saved a large amount of fuel which otherwise would have been used for pumping the water into storage reservoirs.—*Lancet*, June 15, 1918, p. 848. (*D. G.*)

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FLORIDA PUBLIC HEALTH NOTES.

The city health officers of Florida had a conference with the state health officer on August 1–2–3. The program included the following papers: Address of Welcome, Dr. W. H. Cox; Opportunities and Obligations of a City Health Officer, Dr. W. W. MacDonald; Legal Procedure and Rights in Health Work, Dr. Edgar Waybright; Public Health Reports and Records, Dr. S. G. Thompson; Anti-Malarial Work as a Health Measure, Mr. C. N. Harrub; Sanitation at Camp Johnston, Major J. A. Vogelson; Soil Pollution Work, Mr. G. W. Simons, Jr.; Venereal Disease Problem and Its Relation to Public Health, Dr. O. H. Cox; Diagnostic Examinations, Dr. B. L. Arms; Water and Milk, Mr. H. N. Parker; Public Health Publicity, Dr. J. F. Wilson.

As the highly sulphuretted Florida water is not acceptable to tourists, much bottled water is consumed. Regulations have recently been published concerning the care of bottles and bottled water. A recent prosecution has been won based upon an unclean container. Contrary to the expectations of the state authorities, the bottlers are coöperating very well as a rule. (*Geo. W. Simmons, Jr.*)

GEORGIA PUBLIC HEALTH NOTES.

The state health law of 1903 has been amended and the number of reportable diseases increased to thirty-eight, including syphilis, gonorrhea, dengue, malaria, trachoma, and trichinosis.

The State Board of Health has been making a serious effort since the beginning of 1918 to have contagious diseases reported regularly by the physicians of Georgia. As this is practically pioneer work in the state, much remains to be accomplished in order to secure complete returns. In fact, until more extensive plans are worked out, full reporting of contagious diseases will hardly be possible, but much progress has already been made towards securing the coöperation of the physicians in making reports. Dr. T. F. Abercrombie, secretary of the Board, has recently sent out return post-cards to every physician in Georgia and upon these cards reports are being made. Dr. Abercrombie has been appointed collaborating epidemiologist of the U. S. Public Health Service. The establishment of free clinics is announced in each congressional district for treatment of venereal diseases and the investigation of epidemics in the state by Dr. Jos. P. Bowdoin, epidemiologist for the Board and acting assistant surgeon for the U. S. Public Health Service.

The governor, Hugh M. Dorsey, has manifested marked interest in state health activities and the Legislature gives promise of more liberal financial assistance. (*T. F. Abercrombie, M. D.*)

INDIANA PUBLIC HEALTH NOTES.

It is announced that Dr. W. F. King, assistant secretary of the Indiana State Board of Health, will be given special appointment from the U. S. Public Health Service, and he will give his entire time until further notice, to establishing venereal clinics and organizing the anti-venereal fight throughout Indiana. He will be aided by Acting Assistant Surgeon Edw. C. Helwig of the U. S. Public Health Service, now doing special work at New Albany and Jeffersonville.

The following cities in Indiana have already been organized for the anti-venereal fight, each one having passed the model ordinance for conduction of the work: New Albany, Jeffersonville, Valparaiso, Lafayette. The mayor and city council of South Bend have hesitated upon passing the ordinance, but doubtless will pass it and give official sanction to the work in that city. It is hoped it will not be necessary for the State Board of Health to assume public health authority in South Bend.

Surgeon Cobb and Acting Assistant Helwig of the U. S. Public Health Service, Dr. Wm. F. King and Dr. J. N. Hurty of the State Board of Health, will visit Evansville July 24 to secure if possible the passage of a special anti-venereal ordinance, and organize the general work against venereal diseases at that place.

(*J. N. Hurty, M. D.*)

IOWA PUBLIC HEALTH NOTES.

At the regular yearly meeting of the State Board of Health, Dr. W. L. Bierring was re-elected president for the ensuing year. Dr. Guilford H. Sumner has already been re-elected secretary for the coming five years.

The State Board of Health is coöperating fully with the War, Navy, and Public Health Services in keeping the civilian population in the best of health. Twenty-five thousand bulletins on venereal disease are being distributed.

(*Guilford H. Sumner, M. D.*)

MAINE PUBLIC HEALTH NOTES.

Two important phases of the present work of the State Department of Health of Maine have directly to do with winning the war: the establishment of the Portsmouth-Kittery Civil Sanitary District and the sanitary work at Bath, Me.; both of which are in coöperation with governmental agencies and are proving of vital importance locally as well as from a national standpoint.

The presence of the navy-yard at Kittery, Me., with its three or four thousand workmen who live in various near-by towns in Maine and New Hampshire creates a public health war problem of considerable interest. The coöperation of the Maine and New Hampshire state governments with the U. S. Public Health Service in protecting the health of the district marks a new era for extensive district work in Maine.

On the recommendation of Dr. L. D. Bristol, state commissioner of health in Maine, the U. S. Health Service has placed Dr. Paul Preble, past assistant surgeon of that Service, in charge of the district. Dr. Preble is a graduate of Bowdoin College and of Johns Hopkins Medical School.

The rapid growth of Bath, Me., since the declaration of war, together with the need of protecting the large number of men in the shipyards, has created a problem of local and general importance. It has recently been agreed that the National Shipping Board should pay the salary of a health officer in Bath and that Maine should pay $2,500 out of its war emergency fund for running a public health laboratory, which has been established as a branch of the state laboratory. Mr. Chester Kingsly, formerly bacteriologist with the State Department of Health, has been appointed health officer.

(*William H. Greenleaf.*)

MINNESOTA PUBLIC HEALTH NOTES.

At the meeting of the State Board of Health, early this month, a regulation was adopted prohibiting the sale of all remedies, drugs, or proprietaries intended to be used for treatment or alleviation of venereal diseases, except by the prescription of a licensed physician.

A circular letter has just gone out to all physicians announcing the campaign for the control of venereal diseases. A second letter will go out in a week or two.

The State Board of Health, at its July meeting, created a Division of Child Conservation. The director of this division is Dr. E. J. Heunekens of Minneapolis. Two nurses have been employed by the Board and assigned to work in this division. The first task of this division will be to bring about the establishment of a number of child welfare clinics in the smaller communities of the state. Dr. Heunekens has been successfully conducting such a clinic in a city of 6,000, about one hundred miles from the Twin Cities. This clinic meets at regular intervals with Dr. Heunekens and a nurse in attendance. It is at present maintained by one of the women's clubs of the community.

The success of this clinic has demonstrated the possibility for similar work in practically every community of more than 2,500 people.

A child conservation exhibit will be sent to a number of county fairs in the state during the next two months, in charge of a demonstrating nurse.

There are about seventy-five county and inter-county fairs which are held each year in Minnesota, in addition to the state fair. Circular letters were sent to the secretaries of all fair associations, on June 22, offering a social hygiene exhibit which was being prepared by the Venereal Disease Division. Within a week the opportunity had come for more engagements than could possibly be filled—in all, thirty acceptances. It is planned to use the child welfare exhibit at fairs other than those visited by the social hygiene exhibit. In other words, it is planned to have two exhibits on the road during the season, but they will both be sent to the state fair. (*L. W. Freezer.*)

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Provisions for the Care of Tuberculosis Cases.—An agreement between the Northern Division of the American Red Cross, the Advisory Commission of the State Sanitorium, and the Minnesota Public Health Association, contains some novel and interesting features. The several agencies will secure care and treatment for the tuberculous soldier, whether he may have been discharged (1) "in line of duty," (2) "not in line of duty," (3) rejected by local examining boards. The services of experts in the diagnosis of tuberculosis, public health nurses, literature, exhibits, and press stories, will be furnished by the Advisory Commission and the Public Health Association. In order to avoid delay when transportation to a central examining board is necessary, the cost of such is to be borne by the Home Service Section of the local Red Cross chapters, provided the individual is unable to pay for it. The local chapters of the Red Cross will assume the expense of sanitorium or other care, as outlined by the Public Health Association and the Advisory Commission, provided the funds cannot be secured from public agencies for the treatment of tuberculosis. (*D. G.*)

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The Minnesota State Health Department has available the following publications: Plea for Coöperation; Keeping in Fighting Trim; Venereal Diseases Report Card; Girls' Part; Vigorous Manhood; Reasonable Sex Life; Facts Regarding Sex Experience; Modern Treatment of Syphilis; Engagement and Marriage; Circular Letter to Physicians.

Dr. H. W. Hill has returned to his former position as executive secretary of the Minnesota Public Health Association, having been on leave of absence for the last three years as director of the Institute of Public Health and medical officer of health of the City of London, Ontario, Canada, and medical health worker for troops in the first military district. Dr. I. J. Murphy was acting executive secretary at Minnesota during Dr. Hill's absence and has built up the organization to a very high pitch.

MICHIGAN PUBLIC HEALTH NOTES.

The Board of Health of Lansing, Mich., has tendered the health officership of that city to Dr. Herbert L. Wright, of Kenosha, Wis. The doctor has accepted, and begins his work August 1.

Dr. H. B. Neagle, for the last eight months medical inspector and chief of the Bureau of Communicable Diseases of the Department of Health of Jackson, Mich., has been appointed health officer of that city. He succeeds Dr. C. G. Parnall, who has resigned in order to become medical superintendent and director of the University Hospital at Ann Arbor.

MISSISSIPPI PUBLIC HEALTH NOTES.

Dr. Joseph Bolton, of the U. S. Public Health Service, has been detailed by Surgeon General Rupert Blue, by request of Dr. W. S. Leathers, director of public health, and Dr. S. R. Stingily, director, Hygienic Laboratory of the state of Mississippi, to assist in developing the Wasserman work now being instituted by the Mississippi State Board of Health in the Hygienic Laboratory.

A very successful child welfare drive has been carried on in Jackson, Miss. Twenty thousand "Save the Baby" bulletins have been distributed. The authors of the bulletin are Doctors Emmet Holt and Henry Shaw.

Twenty thousand bulletins on rules and regulations governing infectious diseases, pellagra, malaria, etc., are being sent out to normal schools. These will be used by students in hygiene and physiology.

One hundred fifty persons, said by Mr. J. A. LePrince, United States malaria expert, to be the largest force at work on a malarial problem in any one place in the United States, are busy making Harrison and Jackson Counties, on the Gulf Coast, mosquito and malaria proof. The work is progressing very satisfactorily, according to Dr. W. S. Leathers, executive officer of the State Board of Health, who has just returned after inspecting conditions. Two hundred miles of ditching necessary to rid the counties, where many shipbuilding companies are located, of mosquitoes, is 50 per cent completed.

Other sanitary measures are also nearing completion and public health officials are certain that the work will be completed within a short while.

An anti-malaria campaign is also being carried on in Hinds County. Dr. H. H. Howard is in charge and Mr. H. Hingst is field director. Mr. C. M. Roberts has recently been appointed a member of the field force. Dr. W. S. Leathers, state health commissioner, is administrator-director. (*W. S. Leathers, M. D.*

MONTANA PUBLIC HEALTH NOTES.

During the month of July, Dr. G. M. Magruder of the U. S. Public Health Service, has been in the state, helping the State Health Department to organize a campaign for the control of venereal diseases.

A meeting of the State Health Officers' Association was held in Butte, July 8 and 9. About fifty health officers were in attendance—the largest attendance in the history of the Association. The Association went on record as favoring making venereal diseases reportable and, under certain circumstances, quarantinable.

Similar resolutions have been adopted by the Montana Medical Association, the Montana Pharmaceutical Association and the Montana Dental Association, each association pledging the support of its members to the program of the State Board of Health.

On July 20, the State Board of Health met in Helena and passed regulations for the control of venereal diseases. These regulations follow very closely the suggested regulations of the three surgeons general, taking effect September 1, 1918.

In the meantime the campaign of education is being conducted through the Chambers of Commerce in the different towns of the state, with a view of having free venereal clinics established. The city and county authorities at Helena have agreed to establish a free venereal clinic at that place. It is expected that several other towns will do the same.

(*W. F. Cogswell, M. D.*)

NEW YORK PUBLIC HEALTH NOTES.

Venereal Disease Bureau Established.—On July 1 a Bureau of Venereal Diseases was established in the New York State Department of Health in accordance with the provisions of a new law (Chap. 342) passed by the Legislature of 1918. By this law the Bureau is authorized to buy, manufacture, and dispense, remedies for the treatment of venereal diseases, to examine specimens submitted to it, to make all necessary tests, to provide and distribute literature on the suppression and cure of these diseases and to use such other means as seem desirable for the instruction of the public.

The personnel of the Bureau consists of a chief, a consultant, an organizer and inspector of clinics and dispensaries, a lecturer on social diseases, and a public health nurse. The first duty and service of all these officers is recognized to be educational in most instances. Their special duties are suggested by their titles.

The plan of campaign in brief is first to arouse public interest in the prevalence of the diseases, their modes of spreading, their effects upon the individuals and upon the community and finally in methods for their control and suppression. For this purpose each member of the Bureau is available either for organization work or public addresses. For Mother's Clubs, Y. W. C. A., and other female organizations the public health nurse may be called on. A set of lantern slides has been prepared to help make these addresses more interesting.

The second step will be to assist in the establishment of clinics and dispensaries for the treatment of indigent cases. On methods of treatment the consultant will be glad to advise with the proper authorities at any time. On the cost and type of dispensary to establish, the organizer of dispensaries will be able to furnish valuable suggestions from his personal experience. The follow-up methods that will be necessary can be organized by the public health nurse.

The third step will be to furnish arsphenamine (salvarsan) for treatment of indigent cases. There is a small appropriation which will become available later for this purpose. The State Laboratory is doing experimental work on this substance and hopes soon to be able to furnish it as needed.

The necessary steps will be taken at once to put the new act in force. In addition a number of amendments to the Sanitary Code relating to venereal diseases go into effect August 1.* Later the entire state will be divided into sections and each section made a unit for carrying on the work.

The venereal disease campaign has been instituted as a war measure to remedy a condition that has long needed vigorous action. It has required a national crisis to focus public attention upon it and thus to secure the necessary public approval for its prosecution.

Thirty members of the staff of the New York State Department of Health are now in military service, including two directors of divisions. One hundred and two local health officers of the state are also on military duty. Dr. Battin of Westport was recently wounded and is now in a hospital in London. Dr. Cahill of Hoosick Falls, just reported as "missing in action" has been located by the Red Cross as a military prisoner in Germany. (*B. R. Rickards.*)

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Dr. Joseph Roby is acting health officer of Rochester, N. Y., during the absence of Dr. George W. Goler, who is in the Medical Reserve Corps and stationed at Camp Wadsworth, Spartanburg, S. C.

✣

"Delineator" Campaign to Terminate.—The Seventh Baby Campaign of *The Delineator* is soon to come to an end. The director, Dr. C. E. Terry, formerly health officer of Jacksonville, Fla., has been assisted by a staff of eight nurses, an associate health editor, an office force and two mobile laboratories for milk, water, and food work. Thirty American cities have been surveyed, scattered from Massachusetts to Texas. A fairly complete investigation has been made in conditions causing needless infant deaths. A program of health work was outlined and health debits and credits discussed.

NORTH CAROLINA PUBLIC HEALTH NOTES.

Mr. Warren H. Booker, for more than eight years an important factor in the work of the North Carolina State Board of Health, has been granted an indefinite leave of absence to undertake special work in France. This will be under the coöperative agency of the American Red Cross Society and the Rockefeller Foundation, the work to be under the direct control of the Commission for the Prevention of Tuberculosis in France. Mr. Booker expects to sail about September 1.

Mr. Booker joined the State Board of Health more than eight years ago as assistant to the executive secretary. For the past five years he has been Chief of the Bureau of Engineering and Education, in the latter position having been largely instrumental in establishing the high standard of health work which has characterized this State during recent years.

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A Correction.—In the July issue of the Journal, it was stated that the appropriation of the State Board of Health of North Carolina for the ensuing year was $4,050. This should have referred to North Dakota instead.

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*See Official Bulletin of July 16, pages 29–32 inclusive.

During June and the early weeks of July fourteen physicians in North Carolina were convicted of violating the state quarantine law, and were fined varying amounts in local courts. The prosecutions were in each instance inaugurated by field inspectors of the State Board of Health. In most cases the physicians had failed to report contagious and infectious diseases. One had failed to have a birth registered. One was the quarantine officer of a county that had been negligent in the performance of his duties. It is the policy of the board to prosecute every known case of violation of the quarantine law.

To aid it in a state-wide campaign against typhoid fever the State Board of Health has called to its assistance the State Council of Defense, and the two together are making a concerted drive upon the boards of county commissioners of the 100 counties of the state to assist in providing for intensive preventive work during the months of August and September in every county of the State. The State Board of Health is seeking to reduce the number of deaths in the State below 500 for the present year.

(*R. B. Wilson.*)

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Mr. J. M. Landry, formerly bacteriologist and pathologist for the boards of health of Wilmington, city and county, has accepted the laboratory directorship at the Department of Public Health at Akron, Ohio.

NOVA SCOTIA PUBLIC HEALTH NOTES.

The annual meeting of the Association of Medical Health Officers of Nova Scotia was held at Liverpool, July 4. There was a good attendance despite the fact that a large percentage of the physicians of Nova Scotia are on active service with the Army Medical Corps, so that those who remain at home are very busy. An interesting and practical program awakened keen interest and led to very instructive discussions. Dr. W. B. Moore, M. H. O. of Kentville, was elected president for the ensuing year.

The Public Health Act was amended during the last session of the Provincial Legislature by the addition of a number of sections dealing with the venereal diseases. The new legislation provides for the reporting of venereal diseases, for the examination of suspects, for laboratory diagnosis and hospital treatment, prohibits treatment by any except qualified medical practitioners, prohibits advertising of quack remedies, etc., and makes it an offense for any venereally infected person to suffer any act which may lead to the infection of any other person.

A coöperative Committee for Venereal Control in Military District No. 6 has been formed in Halifax, with the Provincial Health Officer (Capt. W. H. Hattie, A. M. C.) as chairman, and other medical officers representing the army and navy as well as prominent citizens occupying other offices. The military authorities of M. D. 6 have been dealing with this matter for some time, and the venereal incidence in enlisted men is now very small, although numerous cases of infection are still being found in men called up under the Military Service Act. This is in keeping with the general experience that venereal is more common amongst civilians than amongst soldiers.

(*W. H. Hattie, M. D.*)

OHIO PUBLIC HEALTH NOTES.

Edmund Kline, formerly of the Pennsylvania State Department of Health, has been appointed associate professor of bacteriology and associate director of the Public Health Laboratory at Toledo University.

Dr. Paul Holmes, director of industrial hygiene work in the Toledo Health Department and also on the university faculty, is on a four months' leave of absence doing research work in industrial hygiene for the U. S. Public Health Service.

Visits to motion-picture theatres by a district physician and a sanitary policeman, comprise a plan adopted by Dr. J. H. Landis, Cincinnati health officer, for detecting quarantine violators. The physician seeks out cases of communicable disease, particularly the childhood epidemics, and the sanitary policeman arrests the responsible adults.

Three Ohio health officers have entered military service recently. Dr. F. M. Sayre, Canton health officer, has entered the Navy Medical Corps, and Dr. A. L. Jones of Lima and Dr. C. W. Waggoner of Toledo have gone into the army.

Acting Assistant Surgeon C. W. Woods of the U. S. Public Health Service has taken charge of the venereal disease clinic for the Camp Sherman extra-cantonment sanitary zone at Chillicothe.

Preliminary steps toward the organization of three new tuberculosis districts in Ohio have been taken recently. The projected districts include fifteen counties. When complete organization is effected in these districts, forty-two counties will be provided with tuberculosis hospitals.

Typhoid fever prevalence in June, as indicated by a total of 159 reported cases, exceeded the June, 1917, prevalence of 152 reported cases. The May prevalence this year was lower than in 1917.

Ohio smallpox case total in June dropped below the one thousand mark for the first time since November. The June total of 588 cases, however, was nearly twice the June average for the previous nine years.

(*V. E. M. Vicker.*)

PENNSYLVANIA PUBLIC HEALTH NOTES.

The State Health Department has issued rules and regulations adopted by the Advisory Board on June 21 for the control of venereal diseases. Physicians are required to place circulars in the hands of all venereal disease patients coming under their care.

Dr. William C. Miller, lecturer and manager of the State Tuberculosis and General Sanitary Exhibit, has been commissioned a major in the Medical Officers' Reserve Corps, and was ordered to report at Fort Oglethorpe, Ga., on July 18.

Pennsylvania has undertaken most expensive mosquito eradication work in the vicinity of Hog Island and the great war industries on the Delaware where about a hundred thousand persons are employed. This work will unwater an area of about seven thousand acres and restore to agriculture great truck farms that were at one time wonderfully productive. The work consists of diking, ditching, pumping, and oiling measures applied so as to completely remove the water from all flat areas and carry off all excess rainfall through ditches free of vegetation. It is being done on a coöperative basis, the state furnishing half the money, engineering and technical training, the great corporations and municipalities contributing on a fifty-fifty basis equaling the state fund.

(*B. Franklin Royer, M. D.*)

RHODE ISLAND PUBLIC HEALTH NOTES.

The health officers of Rhode Island met in Providence on July 25 with the State Board of Health. The necessity for reporting all communicable diseases was emphasized by Dr. B. U. Richards, secretary of the Board. An especial effort was made to improve the reporting of typhoid fever.

The advisability of forming a permanent organization of health officers was discussed but action was deferred to a later meeting.

On June 17, Dr. Martin S. Budlong of Providence, R. I., was appointed a member of the State Board of Health, by Governor R. Livingston Beeckman, to fill the vacancy caused by the death of its president, Dr. John Hilman Bennett, of Pawtucket, R. I. Dr. R. Morton Smith of Riverpoint, R. I., formerly vice-president of the Board was elected president, and Dr. Thomas J. McLaughlin of Woonsocket, R. I., was elected vice-president. Dr. Byron U. Richards of Pawtucket, R. I., was re-elected as secretary of the Board.

At a joint convention of the two branches of the city government of Pawtucket, R. I., held on June 12, Dr. Frank B. Fuller was elected temporary assistant superintendent of health, vice Dr. John Hillman Bennett, deceased.

(*B. U. Richards, M. D.*)

TEXAS PUBLIC HEALTH NOTES.

Amendment of the law enacted by the last Texas Legislature providing for the isolation and treatment of venereal diseases will be asked by the State Board of Health to include standards of infection. This is for the purpose of preventing the defeat of the operation of the law through contesting diagnosis. Plans are being made by the Board to provide for inspection of crews of ships entering Texas ports and examination of travelers entering the state. Fifteen thousand dollars is provided for the administration of the law up to August 31, 1918, and $30,000 for the following fiscal year.

(*Continued on page 629.*)

PRELIMINARY PROGRAMS OF THE FORTY-SIXTH ANNUAL MEETINGS OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

To Be Held at Chicago, Ill., October 14–17, 1918.

Headquarters: Hotel Morrison.

Note.—The following programs are tentative. The final programs will be published in the American Journal of Public Health for September, which for this purpose will appear about September 25.

The program of the Laboratory Section is not available at the time of going to press, and will appear next month. A list of hotels is given on page 628.

PROGRAM OF THE GENERAL SESSIONS.

Presidential Address. Charles J. Hastings, M. D., *Toronto, Ont.*

Team-play for Public Health. George E. Vincent, *President, Rockefeller Foundation, New York City.*

Address: (Subject to be announced). W. C. Gorgas, *Surgeon-General, U. S. A.*

Preservation of the Health of the Civil Population during the War. Victor C. Vaughan, *Colonel, Medical Corps, N. A.*

Some Public Health Problems and Opportunities Created by the War. William H. Welch, *Major, Medical Corps, N. A.*

The Accomplishments of Public Health. Statistical and Historical Evidence. Frederick L. Hoffman, Ph. D., *Statistician, Prudential Life Insurance Co., Newark, N. J.*

War-time Importance of Narcotic Drug Addiction. Ernest S. Bishop, *Professor of Clinical Medicine, New York University* and *Bellevue Hospital Medical College, New York City.*

The Future of the American Public Health Association. Lee K. Frankel, Ph. D., *Treasurer, American Public Health Association, New York City.*

Re-organization of the American Public Health Association. W. A. Evans, M. D., *Chicago, Ill.*

PROGRAM OF THE PUBLIC HEALTH ADMINISTRATION SECTION.

War and the Conservation of Child Life. S. Josephine Baker, M. D., *Department of Health, New York City.*

Scoring of Health Activities in Cities. Paul B. Brooks, M. D., *State Health Department, Albany, N. Y.*

Rural Sanitary Privies. Warren H. Booker, *State Board of Health, Raleigh, N. C.*

Fashions as Affecting Public Health. Jeanette Throckmorton, *Chariton, Ia.*

Taking the Board of Health to the People. Dr. B. L. Arms, *Chief Bacteriologist, State Board of Health, Jacksonville, Fla.*

War Program of the Federal Children's Bureau. Speaker to be announced later.

Venereal Diseases. Dr. John Dill Robertson, *Health Commissioner, Chicago, Ill.*

Vaccination as a War Measure. Dr. Maurice Ostheimer, *Department of Health, Philadelphia, Pa.*

A Plea for a Public Health Magazine. Dr. B. Liber, *New York City.*

A joint session with the Laboratory Section. See Laboratory Section program.

Round Table Discussion of Unusual Experiences, by twenty health officers.

Committee Reports.
- a. On National Program of Prenatal Care.
- b. On Standard Regulations for the Control of Communicable Diseases.
- c. On Standardization of the Work of Public Health Officials.
- d. On Rural Health Administration.
- e. On Venereal Diseases.

PROGRAM OF THE SOCIOLOGICAL SECTION.

Round Table Discussion—What is the Effect of the High Cost of Living on Public Health?

Leaders:

John Dill Robertson, M. D., *Commissioner of Health, Chicago, Ill.*
Louis Harris, M. D., *Director Bureau of Preventable Diseases, New York, N. Y.*
E. R. Kelley, M. D., *State Commissioner of Health, Boston, Mass.*

What Is the Relation of Wages to Public Health?

The Relation of Wages to Public Health. B. S. Warren, *Assistant Surgeon-General, Public Health Service, Washington, D. C.*

The Relation of Wages to Public Health as Viewed by Labor. Arthur E. Holder, *Member Federal Board for Vocational Education, Washington, D. C.*

The Relation of Wages to Infant Mortality. Miss Julia Lathrop, *Director Federal Children's Bureau, Washington, D. C.*

Discussant, H. A. Millis, *Secretary, Illinois Health Insurance Commission, Chicago, Ill.*

How May Hospital and Dispensary Organizations be Re-constructed for Increased Social Efficiency?

Group Medicine. Michael M. Davis, Jr., Ph. D., *Director Boston City Dispensary, Boston, Mass.*

Discussant, W. A. Sawyer, *Major, M. R. C., Washington, D. C.*

Corporation Hospitals and Dispensaries. Harry E. Mock, *Lieutenant-Colonel M. R. C., Washington, D. C.*

Discussant, Loyal A. Shondy, *Chief Surgeon, Bethlehem Steel Company, Pittsburgh, Pa.*

Hospital and Dispensary Organizations. R. A. Bolt, M. D., *Chief of Bureau Child Hygiene, Department of Public Welfare, Division of Health, Cleveland, O.*

What Adjustment in Health Administration Must be Made as a Result of War Conditions?

Venereal Diseases. William F. Snow, *Major, M. R. C., Washington, D. C.*

Discussant, S. J. Crumbine, *Secretary Kansas State Board of Health, Topeka, Kans.*

Tuberculosis. Donald B. Armstrong, M. D. *Framingham, Mass.*

Discussant, Hoyt E. Dearholt, M. D., *Executive Secretary, The Wisconsin Anti-Tuberculosis Association, Milwaukee, Wis.*

Industrial Accidents and Diseases. Emery R. Hayhurst, M. D., *Consultant, Division ofIndustrial Hygiene, Ohio State Department of Health, Columbus, Ohio.*

PROGRAM OF THE SECTION ON INDUSTRIAL HYGIENE.

FIRST SESSION.

The Problems of Industrial Hygiene.

The Problems of Industrial Hygiene. GEORGE M. PRICE, M. D., *New York, N. Y.*

The Problem of Organic Dust in Modern Industries. DR. FREDERIC M. HOFFMAN, *Newark, N. J.*

The Problem of Industrial Poisons. J. W. SCHERESCHEWSKY, M. D., *Washington, D. C.*

The Problem of Industrial Fatigue. FREDERIC LEE, M. D., *New York, N. Y.*

The Problem of Compensation for Industrial Disease. FREDERIC L. VAN SICKLE, M. D., *Olyphant, Pa.*

The Problem of Women in Industry. ELIZABETH B. BRICKER, M. D., *Harrisburg, Pa.*

SECOND SESSION.

The Problems of the War Industries.

The Explosives Industry. W. G. HUDSON, M. D., *Wilmington, Del.*

The Textile Industry. A. J. LANZA, M. D., *Pittsburgh, Pa.*

The Dye Industry. ALICE HAMILTON, M. D., *Chicago, Ill.*

The Steel Industry. LOYAL A. SHOUDY, M. D., *Bethlehem, Pa.*

The Shipbuilding Industry. LIEUTENANT-COL. PHILIP S. DOANE, *Philadelphia, Pa.*

THIRD SESSION.

Industrial Hygiene in Relation to the Efficiency of the Worker.

Housing. ROYAL MEEKER, M. D., *Washington, D. C.*

Lighting. PROFESSOR C. E. CLEWELL, *Philadelphia, Pa.*

The Clinic for Vocational Diseases. LOUIS I. HARRIS, M. D., *New York.*

Industrial Medicine and Surgery in Relation to War and Production. OTTO P. GEIER, M. D., *Cincinnati, O.*

PROGRAM OF THE SECTION ON VITAL STATISTICS.

FIRST SESSION.

An Inquiry Into the Reliability of Causes of Death. LOUIS I. DUBLIN, PH. D., and GEORGE H. VAN BUREN.

Election of Nominating Committee.

Report of the Committee on Institutional and Hospital Statistics. FREDERICK L. HOFFMAN, PH. D., *Chairman.*

Report of the Committee on Morbidity Reports and Statistics. A. J. CHESLEY, M. D., *Chairman.*

Report of the Committee on Membership. CHARLES F. BOLDMAN, M. D., *Chairman.*

Report of the Committee on the Accuracy of Certified Causes of Death and Its Relation to Mortality Statistics and the International List. HAVEN EMERSON, M. D., *Chairman.*

Report of the Committee on Legislation. CHARLES V. CHAPIN, M. D., *Chairman.*

SECOND SESSION.

Report of Nominating Committee and Election of Officers and Section Council.

Report of Committee on Morbidity Records and Mortality Statistics in Industry. LOUIS I. DUBLIN, PH. D., *Chairman.*

Difficulties Encountered in Allocating Nonresident Deaths in the State of New York. OTTO R. EICHEL, M. D.

Relation of Vital Statistics to Public Health Administration. WM. F. PETRIE.

Collection of Birth Records in Thinly Settled Communities. L. W. FEEZER.

Report of the Committee on Amendments to the Standard Certificate of Birth. WILLIAM H. DAVIS, M. D., *Chairman.*

THIRD SESSION.

The Pioneer Registration State of the West. WM. F. PETRIE.

Report of the Committee on Registration Affairs. WILLIAM H. DAVIS, M. D., *Chairman.*

Report of the Committee on the 1920 Census and Its Relation to Vital Statistics. WM. H. GUILFOY, M. D., *Chairman.*

Family Statistics from Registration Sources. EDWIN W. KOPF.

Coöperation of State and Federal Governments in the Registration of Births and Deaths. JNO. EMERSON MONGER, M. D.

Birth Registration in Connecticut. JAMES P. BALFE.

FOURTH SESSION.

Report of Section Council and Nomination of Standing Committees for Ensuing Year.

The Toll of the Degenerative Diseases. A Plan for Its Reduction. E. B. FINK, *Chicago, Ill.*

Nine Months of Infant Mortality in the United States During War. FREDERICK S. CRUM, PH. D.

Report of the Committee on Forms and Methods of Statistical Practice. WALTER F. WILLCOX, PH. D., *Chairman.*

Report of the Committee on Nonresident Deaths. W. R. BATT, M. D., *Chairman.*

Report of the Committee on Resolutions. WM. F. GUILFOY, M. D., *Chairman.*

Unfinished Business.

PROGRAM OF THE FOOD AND DRUGS SECTION.

NOTE.—The list of speakers for this program will be announced in the September JOURNAL.

FIRST SESSION.

General Considerations on War-time Foods.

Address of Chairman: The Food Supply of the United States after a Year of War.

Reports of Committees on: Conservation and Development of Food Supplies; Municipal Food Administration; Nutritional Problems.

What is a "Balanced Ration"?

Why the Maintenance of the Dairy Industry is Paramount for a Nation at War.

The Real Relation of Foods and Food Inspection to the Public Health.

SECOND SESSION.

The Civilian's Foods in War time.

Reports of Committees on: Preparation, Packing, and Transportation of Foods; Relation of Foods to Disease; Retail Distribution and Marketing.

A Year's Changes in Food Habits.

Meats—The Present Aspect of Supply, Conservation, and Development.

The Interrelation of Controls of Quantity and Purity of Foods. The Irreducible Minima of the Latter in War-time.

Ersatze and *Surrogates;* Some Lessons from Europe.

THIRD SESSION.

The Soldier's Food.

Reports of Committees on Canning; Cold Storage; and Meat Inspection.

The Fighter's Food Needs.

Hospital Food Needs.

Conservation in Camp Feeding.

The Organization of an Army's Food Supply.

FOURTH SESSION.

(Probably a Joint Session with the Sociological Section.)

Reports of Committees on Drugs and Nostrums, Habit-forming Drugs, and Milk and Dairy Products.

Price Control of Foods. Why is it Justified?

The Supply of Pharmaceuticals in War-time; Importance and Dangers.

Legitimate Use of Narcotics in War-time.

Two War Jokers in Narcotics.

PROGRAM OF THE SANITARY ENGINEERING SECTION.

Committee on Air Supplies. Prof. F. H. BASS, Minneapolis, Minn., *Chairman.*

Committee on Water Supplies. F. F. LONGLEY, N. Y., *Chairman.* EDWARD E. WALL, St. Louis, Mo., *Acting Chairman.*

Committee on Sewerage and Sewage Disposal. FRANK A. BARBOUR, Boston, Mass., *Chairman.*

Committee on Sanitary Control of Waterways. H. P. Eddy, Boston, Mass., *Chairman.*

Committee on Refuse Collection and Disposal. Samuel A. Greeley, Chicago, *Chairman.*

Committee on Street Cleaning. James W. Paxton, Washington, D. C., *Chairman.*

Committee on Constitution. Samuel A. Greeley, Chicago, *Chairman.*

Committee on Works Operation and Analytical Methods. Chas. B. Hoover, Columbus, Ohio, *Chairman.*

Committee on Plumbing and Drainage of Buildings. No Chairman.

Committee on Milk Pasteurization. H. A. Whittaker, State Sanitary Engineer, Minneapolis, Minn., *Chairman.*

The Work of the Department of Health and Sanitation of the U. S. Shipping Board. Lieutenant-Colonel P. S. Doane, *Philadelphia, Pa.*

——————Professor E. B. Phelps, *Washington, D. C.*

The Sewage Treatment Problem in Chicago. C. D. Hill, *Engineer, Board of Local Improvements, Chicago, Ill.*

Dissolved Oxygen as an Index of Pollution of New York Harbor. Kenneth Allen, *New York City.*

The Recognition Given The Sanitary Engineering Work in the Government War Activities George W. Fuller, *New York City.*

The Chlorination of the Chicago Water Supply. John Erickson, *Chicago, Ill.*

Chemical Control of Water Chlorination. W. J. Allen.

Garbage Improvement at Louisville. Samuel A. Greeley, *Chicago, Ill.*

CHICAGO HOTELS

Bismarck (cap. 300): 171 W. Randolph St. Single room with bath, $1.50; single room without bath, $1.

Brevoort (cap. 500): 120 W. Madison St. Single room with bath, $2.50 and $3; single room without bath, $1.50.

Grand Pacific (cap. 400): Jackson Boul. and Clark St. Single room with bath, $2 and up; single room without bath, $1.50 and $2.

La Salle (cap. 1,800): Madison and LaSalle Sts. Single room with private bath, $3, $3.50, $4, and $5; single room with detached bath, $2, $2.50, and $3.

Morrison (cap. 1,000): Clark and Madison Sts. Single room with bath, $2 and up.

Palmer House (cap. 1,000): State and Monroe Sts. Single room with bath, $2.50, $3, $3.50, $4, and $5; single room without bath, $1.50 and $2.

Sherman (cap. 1,500): Clark and Randolph Sts. Single room with bath, $2, $2.50, $3.50, $4, and $5.

(TEXAS—*Continued from page 622.*)

A modern motion-picture outfit has been provided the tuberculosis hospital maintained by Dallas County, Tex., near the city of Dallas on recommendation of Dr. Wright, resident physician, and Mrs. Wright, supervising nurse. Recreation is recognized as an important factor in the treatment of the inmates and a series of weekly lectures and other recreational features has been arranged for through the Civic Federation of Dallas.

Eighty-three convictions for violations of the Texas pure food laws have been secured since January 1, 1918, by R. H. Hoffman, Jr., state food and drug commissioner.

An organized campaign is being carried out by the Dallas (Texas) County Medical Society to bring about medical inspection in the public schools of the city of Dallas. Dr. John S. Turner, in a paper recently read before the Society, pointed out the fact that this city is one of the 5 per cent of American cities with a population of 100,000 or more which does not have such inspection.

Pollution of Trinity River with sewerage by the city of Fort Worth, Tex., must be stopped and legal proceedings will be taken if necessary, according to a statement by Dr. W. B. Collins, state health officer. Numerous protests have been made by land owners and residents of towns along the water course of the health menace during the past five years, but Fort Worth refused to cease emptying sewerage into the river because of the fact, it was stated, that the city was financially unable to build a sewage disposal plant.

Action by the state authorities was brought about by Dr. W. A. Carnes, city health officer of Dallas, who secured affidavits and other data on which legal proceedings under the Texas anti-stream pollution law may be based if such action is found necessary.

The city commissioners of Fort Worth have advised Dr. Collins that plans for a sewage disposal plant have been completed and bids will soon be asked for.

Under the auspices of the Texas Social Hygiene Association ministers of thirty Dallas churches spoke on Social Hygiene, Sunday, July 6. The day was designated "Social Hygiene Day." Lectures on this subject are being arranged for regularly in the city and at the near-by army camps by S. B. Murray, local representative of the Association, assisted by Dr. J. H. Black of Dallas and Dr. K. H. Beall of Fort Worth. The work is endorsed by the Fosdick Commission. (*T. H. Barrett.*)

WISCONSIN PUBLIC HEALTH NOTES.

Dr. F. M. Harris, formerly director of the state coöperative laboratory at Fond du Lac, has joined the army medical corps.

The Milwaukee Health Department unfurled a service flag with twenty-three stars.

Dr. H. L. Wright, full-time health commissioner of Kenosha, has been elected health commissioner of Lansing, Mich., his work to begin August 1.

An ordinance pending in the Milwaukee common council seeks to raise the butter fat requirement for milk sold in Milwaukee from 3 to $3\frac{1}{2}$ per cent.

Aggressive campaigns are under way to secure county nurses in many counties of the state as a part of the Children's Year program to save 2,410 child lives in Wisconsin during the year.

Milwaukee's death-rate in June, computed at Washington, was 9.8, the city ranking eighth among the larger cities of the country. The city has been remarkably free from sickness, except whooping-cough, which in July was on the increase.

Rhinelander citizens have been instructed to boil city water before drinking, tests having shown impurities.

Dr. Anna M. Reed, Michigan City, Ind., has become resident physician at Muirdale, Milwaukee County's tuberculosis sanatorium.

In his annual report, Dr. T. J. Oliver, health officer of Green Bay, recommended increase of the per capita public health expense from 12 cents, as at present, to at least 50 cents; the employment of a second public health nurse, a full-time health officer, a sanitary inspector, a milk and food inspector, and a municipal laboratory.

Menasha is discussing the building of a garbage incinerator.

The Kenosha Health Department has begun the enforcement of a new milk ordinance by inspecting all dairies supplying the city with milk.

Dr. W. L. Holt, full-time health officer of

Beloit, is endeavoring to secure passage of a milk ordinance, without which, he told the common council, he refuses to be held responsible for any epidemic traceable to infected milk.

Edward A. Babcock, dairy and food inspector of Madison, recently elevated to assistant city health officer, has applied for service in the sanitary corps of the army.

The Milwaukee Anti-Tuberculosis League has been organized to specialize in treating children.

According to a report by the New York Milk Committee, La Crosse, Wis., ranked third in 1917 among cities in the United States having the lowest infant mortality rate, with a rate of 42.2. The work of a visiting nurse, careful inspection of milk under a full-time health officer, and inspection of school children are primal factors in this result.

The Wisconsin Anti-Tuberculosis Association is conducting a ten months' course for public health instructors to meet the nursing needs of the state in the war emergency, enrolling for the most part young women of the teaching profession who are familiar with health educational work and who are naturally qualified. Dr. E. V. Brumbaugh, formerly of the Milwaukee Health Department, is in charge of the course.

Problems of community health, with many war-time phases, were featured at the fourth biennial conference of health officers of the state of Wisconsin, held in Madison, August 7–8, under auspices of the State Board of Health. The law requires towns, villages, and cities, to send their health officers to this conference at the community's expense. There are 1,684 health officers in Wisconsin.

The program included the following addresses: an address by Governor Philipp; discussion on Venereal Disease Problems, by a U. S. Public Health Service representative; Child Welfare, by Dr. Dorothy Reed Mendenhall of the Children's Bureau; Garbage Disposal by Dr. A. H. Broche, health commissioner of Oshkosh, Wis.; Reporting of Births and Deaths, by Dr. G. C. Ruhland. Five deputy state health officers conducted a symposium on General Health Administration. (*L. W. Bridgman.*)

MISCELLANEOUS.

A revision of the state health laws of North Dakota is contemplated.

Mr. Frank Woodbury Jones, formerly of Fitchburg, Mass., has resigned as supervising chemist of the Fitchburg Sewage Disposal Works and accepted a position as assistant engineer in the New York State Department of Health.

Dr. William C. Fowler has been appointed to succeed Dr. William C. Woodward as health commissioner of the District of Columbia. He has until recently been assistant health officer.

Mr. C. H. Wells, who for thirteen years has been health officer at Montclair, New Jersey, has been appointed state health commissioner of Delaware. Mr. Wells is probably the first non-medical state health commissioner to be appointed in this country.

BOOKS AND REPORTS REVIEWED

The Principles of Hygiene. *D. H. Bergey, M. D., Dr. P. H., University of Pennsylvania, W. B. Saunders, Philadelphia. Pp. 543. Cloth, $3.50.*

Professor Bergey's text-book has just appeared and its sixth edition which marks the appreciation in which it is held. It is called a practical manual for students and health officers, as well as a college text-book, and its several chapters supply much well chosen material.

As a practical guide to the health officer, we must confess, however, that the treatment of several very important subjects leaves much to be desired.

Chapter I is an admirable "resume" of the Physics of Air; but Chapter II, on Ventilation, which is the practical application of the principles set forth in Chapter I gives almost no details which would aid a health officer in supplying definite directions to those installing ventilation.

Much the same remarks apply to Chapter III which deals with Heating.

Chapter IV deals with Sewage Disposal, and we are at a loss to understand why the author finds it necessary to give six pages to plumbing appliances and but half a page to the problem of sub-surface sewage disposal by irrigation, the problem which has most to do with the sewage disposal of the many millions of population living outside towns having no municipal sewerage system.

What has been said regarding the lack of information of practical value is most marked in Chapter VI, on Garbage. This subject, so important as to cause special bulletins on preventing waste in garbage, has only four pages in a book of 500 devoted to the subject, while the next chapter has sixty pages given to Food and Diet. This chapter is interesting, but much of it belongs to a work on physiology rather than to one on practical hygiene. The chapters on Exercise, Clothing, and Cleanliness, though short, are satisfactory and properly give place to a very comprehensive and careful chapter on Industrial Hygiene. Chapter XII, deals with School Hygiene and has material of value on the various phases of the subject. It would seem, however, that the important problem of school lighting might have had enough space given it to supply some definite information as a guide to medical officers when asked to deal with the sanitation of school buildings. Chapter XIII deals with Military Hygiene, and in these strenuous days the author may very well be excused for devoting thirty pages to this important subject; but are followed by what is undoubtedly the most carefully prepared chapter in the work, that on Causes of Disease.

The chapter on Disinfection is a curious illustration of the book-making habit. In these days when hospital "cubicle" isolation is replacing formalin and other old disinfection methods, we find four pages given to describing how to apply the gas, and only half a page to isolation hospitals. The chapter on Quarantine is historical mainly, and repeats such archaic information as Michigan tables for 1886–90 regarding the effects of isolation and disinfection. The last chapter, on Vital Statistics, deals with the principles involved and illustrates the benefits which accrue to any country which organizes a statistical bureau.

Peter H. Bryce, M. D.

Chemical and Biological Survey of the Waters of Illinois.—*Water Survey Series No. 14. Illinois Water Survey, Urbana, Ill.*

The bulletin covers all of the routine and research work carried on at the Illinois State Water Survey during the year 1916 under the direction of Prof. Edward Bartow. During 1916, 3,624 samples of water were received, a larger number than that in any other year since the foundation of the survey. Of all well waters 45 per cent were condemned. A large number of places were visited and plans examined by the sanitary engineers for proposed installations or improvements of water works or sewerage. Of the special studies embodied in the report the one on "The Activated-Sludge Method of Sewage Treatment" by Dr. F. W. Mohlman deserves particular attention. It was found that strong sewage required more than 1.5 cubic feet of air per gallon of sewage. The nitrogen in the sludge increased by from 0.4 to 1.5 per cent of nitrogen daily until an average of 5.1 per cent of nitrogen was obtained. Excessive aeration decreased the total quantity of the sludge and the per cent of nitrogen in the sludge. The content of phosphorus pentoxide varied in the same way as nitrogen reaching an average of about 3 per cent. Centrifuges gave promising results in dewatering sludge. A study of the "Radio-activity of Illinois Waters" by Clarence Scholl showed that there are some springs in the state whose radioactivity equals that of waters for which medicinal value is claimed. A paper by F. N. Crawford on the "Decomposition Products of Sewage Disposal" deals with the effluent gases from activated sludge treatment. It shows that an increment of carbon dioxide during aeration is derived from biological fermentation. In studying "The Effect of Gas House Waste on the Biochemical Oxidation of Sewage," C. W. Lenzing found that certain waste liquors from the manufacture of illuminating gas had little or no effect upon the biological purification of sewage.

The 1916 report of Professor Bartow is a worthy successor to the preceding volumes and should be found in the reference library of every one interested in water purification and sewage disposal.

Arthur Lederer, M. D.

INDUSTRIAL HYGIENE AND OCCUPATIONAL DISEASE

Abstracted by Drs. E. R. Hayhurst, R. P. Albaugh and P. M. Holmes.

Effects of Dust Inhalation upon the Lungs.—In attempting to derive a better understanding of the causes in changes of normal appearances of the lungs in roentgenologic work, a study was made of the chests of a large number of individuals engaged in various dusty occupations, including carpet and plush workers, tobacco workers, silk workers, potters, metal grinders, cement workers, asbestos workers, coal miners and marine firemen. Each case was given a thorough clinical examination followed by a roentgenoscopic study and a roentgenographic examination by stereoscopic plates. The clinical and the roentgenologic studies were made independently and as yet there has been no comparison of the details brought out by the two methods of examination, except in a general way. The subject is regarded as a study of pneumoconiosis and reference to such terms as anthracosis, siderosis and chalicosis have been omitted. Three stages are recognized in the progress of the condition: the first stage is characterized by an increase in the hilus shadows and a thickening of the usually prominent trunk shadows and an undue prominence of the finer linear markings. This is due to irritation of the air passages and amounts to a chronic bronchitis. The second stage is characterized by a more or less uniformly arranged mottling throughout the lung structure, due to depositions of dust in the lymph structures, cells, and fibrous tissue interspaces, with the addition of a certain amount of localized fibrosis. This stage has usually been regarded as the typical case of pneumoconiosis. The onset of this condition depends largely upon the quality of dust inhaled, appearing early in the case of inorganic dust and quite late in those inhaling organic dusts. In the third stage diffuse fibrosis appears. This differs little from the terminal stage of chronic tuberculosis. The condition often closely resembles consolidation. The heart and vessels are frequently dragged out of place. The bronchiectatic cavities are quite prominent. The differential diagnosis between the fibrosis resulting from tuberculosis and pneumoconiosis is frequently a difficult problem.—Pancoast, Miller and Landis, *Amer. Jour. of Roentgenology*, March, 1918, pp. 129–138.

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Color Blindness as a Loss of Sight.—The Supreme Court of Nebraska affirms a judgment for the plaintiff for $1740.00, the full face of a benefit certificate held by him in the defendant association, and interest, on account of his having become afflicted with color blindness and for that reason having been discharged from the service of a railroad company that had employed him as a railroad trainman. A rule of the association provided that any beneficiary member in good standing who should suffer the complete and permanent loss of sight of both eyes should be considered totally and permanently disabled and should thereby be entitled to receive the full amount of his beneficiary certificate. The plaintiff contended that as a railroad trainman he had become totally blind, and that within the terms of the policy held by him in the defendant association he had suffered the complete and permanent loss of the sight of both eyes, which the defendant denied. In such case the Supreme Court rules that while the sight of the insured may not be entirely destroyed for some purposes, it will be deemed destroyed and lost as to the particular vocation of a railroad trainman, and he will be held entitled to recover on the benefit certificate which he holds. Three members of the Court dissent. —*Jour. Amer. Med. Assn.*, May 25, 1918, p. 1565.

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Point of Election and Modes of Invasion in Pulmonary Tuberculosis.—It is generally accepted by pathologists that the first stage of pulmonary tuberculosis is an involvement of the glandular and lymphatic structures of the lungs. In pseudotuberculosis of sheep and cattle the pulmonary glands are first involved. Pulmonary pigmentation shows first in the peribronchial glands. If conditions are favorable, crippling of the peribronchial glands is followed by the arrest of a bacillus and the formation of a tubercle in lung tissue proper. If this focus progresses to softening, it breaks through into the air vesicles, or into adjacent healthy tissue, where, in the latter case, bacilli that have been set free are again arrested by the highly complex system of lymph channels. It is essential to know the anatomic routes by which tubercle bacilli reach the point in lung tissue where they are arrested and colonized. There is doubt whether dust or bacteria are ever actually driven directly into the air sacs in the ordinary act of breathing, or even by forcible inspiration. It seems improbable also that phagocytes carry dust or organisms direct to the air sacs and plant them there. It seems probable that the suction of adjacent lymph streams in the non-ciliated terminal branches of the bronchioles would draw dust or organisms backward into the air sacs and thence into open lymph vessels in which they would drift until arrested in some glandular storehouse along that chain. A mass of experimental evidence in proof of the inhalation method of infection of the lungs has been advanced. On the other hand a number of reliable investigators have concluded that infections are brought about through the intestinal tract. Also it has been shown that the continuous introduction of lampblack into the intestinal tract over a long period of time will produce well-marked anthracosis. However, believers in the ingestion method, especially those who are wedded to the theory that milk is the prime factor in the spread of tuberculosis, are confronted with the confusing fact that the cow herself is not a milk feeder notwithstanding her marked susceptibility to tuberculosis. But a study of the habits of this animal is convincing that an infected cow spreads the contagion by explosive coughing, thus sending droplets of sputum in all directions on her own food and on the food of her adjoining neighbors. If bacilli first reach the circulation, then there is no good reason to doubt that all portions of the human and bovine lungs are exposed to an equal degree of infection or dosage. No portion of the lung possesses a specific biochemical constituent that would sensitize it to the tubercle bacillus, nor does the bacillus possess selective properties for any special portion of the lungs. Whatever exact reason exists for the constant invasion of a specific area in the lungs of man and cattle, the causes for this point of election must be wholly physio-anatomic.—J. O. Cobb, M. D., *Jour. Amer. Med. Assn.*, May 25, 1918, pp. 1511–1516.

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Employment Conditions in Shipyards.—A weekly report giving the daily attendance of all employes is required from every shipbuilding company. The average daily attendance for each week is calculated by adding the attendance for all the days of the week, including Sunday, and dividing by six, regardless of whether or not the company has a Sunday shift. The ratio of this average daily attendance to the total number on the pay roll expressed as a percentage of the pay roll gives an approximately accurate idea of the steadiness of the working force. Absenteeism has been found to be due to lack of material, poor housing and transportation facilities, sickness, injuries and voluntary absences for various other reasons. For 127 shipbuilding companies the average daily attendance percentage for January was 79.3 and for February, 82.5. Labor turnover is due to many causes, most of which operate more intensively on casual than upon skilled labor. The turnover percentage varied from 68 for two small steel-ship building companies in the fourth district to 287 for the three fabricated yards combined and 257 for the six wood-type yards combined in the fifth district. A large labor turnover always represents heavy economic loss through reduction of efficiency, loss of work time, other expense and waste involved in the replacement of men and the consequent slowing down of production. There is a constructive program under way for bringing about less absenteeism and labor turnover in connection with the ship yards.—*Monthly Review, U, S. B. of L. S.*, May, 1918, pp. 183–191.

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Washington's New Medical System.—The state of Washington has amended its workmen's compensation law so as to provide for practically unlimited medical and hospital service, one half of the cost of which is to be borne by the employee. Provision is made for medical administration through local medical aid boards under supervision of the state board. This provision went into effect July 1, 1917, and a review of the first three months' experience has just been issued. The law provides for a state medical aid board composed of the medical advisers of the Industrial Insurance Department and one representative each of the employers and employees. The board divides the industries of the state into five classes according to hazards. The board is also authorized to promulgate rules, issue a maximum medical fee bill, approve physicians' and hospitals' bills, and approve contracts between employers and employees. The immediate administration of medical service is under the supervision of local medical aid boards. Under the law the careless employer cannot be penalized by being placed in a higher group. The other establishments in this class must, in a measure, pay for his accidents. Among the defects pointed out are the inability to obtain necessary statistics to make a proper re-classification, the possibility of fraud, and situations in which, because of labor turnover, the majority of employees are bound by contract although they do not favor the contract system.—*Monthly Review, U. S. B. of L. S.*, May, 1918, pp. 230–233.

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Dust, Gases and Fumes in Modern Industry.—Of the forty million people engaged in gainful occupation, at least four million are employed in more or less dusty trades with exposure to injurious dusts, poisonous fumes and deleterious gases. Never was the value of human labor as high as at the present time, and no one can completely estimate the social and economic losses to the Nation as the result of the inhalation of these substances. The whole subject of industrial hygiene has received inadequate consideration on the part of the state health and labor authorities practically throughout the entire country. There is need of legislation, particularly for a drastic occupational disease compensation act. Vital statistics should be subjected to critical consideration with reference to correlation of the occupation of the deceased and the causes of death. It should be made mandatory upon attending physicians to fill out death certificates with completeness, not only as regards the industry in which the deceased was employed, but also the specific occupation followed at the time of death. The state and the industries only advance their own interests by promoting the welfare of those who by their labor create all that is essential to the commonwealth.—F. L. Hoffman, *Bull., Penna. Dept. of Labor and Ind.*, Vol. V, No. 1, 1918, pp. 120–133.

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Furunculosis and Infections Among Machinists.—Following an investigation into the cause and prevention of furunculosis and infections among machinists, the Ohio State Department of Health has distributed the following instructions in the form of leaflets among the plants throughout the state:

MACHINISTS.

Avoid Boils and Infections.

1. Cutting compounds and cutting oils often carry germs which cause *Boils* and *Blood poisoning.*
2. Oils become polluted from pimples or boils on your hands and arms. Report these to your foreman and have them dressed at once; by so doing you will protect yourself as well as others from boils and blood poisoning.
3. Use your own waste, towels and wiping rags; don't let others use yours. Do not spit into oils or reservoirs of machines. Your company supplies clean oil—keep it clean.
4. Change oil-soaked clothing twice a week. Take frequent baths. Wash your hands and arms carefully with any good cleaner which will cut oil. Wash at noon and in the evening. Do not wash in alkali water.
5. No injury is too slight to have first-aid dressing. Disease germs gain entrance into mere scratches and cause boils and blood poisoning.

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Manufacture and Loading of High Explosives.—The Advisory Commission, Council of National Defense, has had printed and is distributing the report of the Divisional Committee on Industrial Diseases, Poisons and Explosives as "*Welfare Work Series No. 2.*" It is pointed out that at the conclusion of the second meeting of the Committee the manufacturers' representatives present—constituting the greater part of the rules and regulations in the report as the the industry—agreed without exception to adopt the rules and regulations in the report as the practice for their establishments. The rules apply to all factories where nitration is carried on and in which poisonous nitro and amido compounds are manufactured or handled.

Laundries and Laundry Workers in New York City.—The material in this report on the general working conditions in laundries is based on careful investigation of forty-two steam laundries in Manhattan and Brooklyn. The total number of employees in the establishments was 3,024, of whom 715 were men and 2,039 were women. Medical examinations were made of 68 men and 141 women to determine the effect upon them of the different processes and conditions of work. The sick and disabled, and those whom the occupation has made the victims of disease, were not found and of course could not be included. The questions studied in connection with the investigation included the extent to which the handling of soiled linen communicates tuberculosis and various acute infectious diseases, the effects of working in an atmosphere heavily charged with steam, and whether or not there are any injurious effects upon the generative organs of female workers resulting from the strain of long continued standing and other activities incident to this industry. In addition, an effort was made to determine what effect wages and hours of labor have upon the health of workers and also whether or not there exist health hazards peculiar to this industry.—*The Cost of Clean Clothes in Terms of Health,* Louis I. Harris, New York City, Dept. of Health, and Nelle Swartz, Consumers' League of the City of New York, 96 pp.

PUBLIC HEALTH LABORATORY NOTES

Abstracted by ARTHUR LEDERER, M. D.

Gas Gangrene.—Two anærobes, the septic vibrio and the *Bacillus bellonensis* were found so constantly in 121 complete analyses in 100 cases of gas gangrene, that he is convinced that these are the specific agents of primary gas gangrene. The former seems to be responsible for the gas gangrene, and the *bellonensis* for the gas gangrene and the edematous forms. They reproduce constantly the disease in animals, and exert the same toxic action.—E. Sacquépée, *Presse Médicale, Paris,* 26, 197 (1918); *Jour. Am. Med. Assoc.,* 70, 1983 (1918).

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The Staphylococcus Albus.—A number of typical cases seem to confirm the pathogenic properties of the *Staphylococcus albus.* The author has never been able to cultivate it from the blood of apparently healthy persons, but found it frequently in the blood of those presenting symptoms suggesting some coccus septicemia.—A. Pari, *Gazzetta degli Ospedali e delle Cliniche, Milan,* 39, 273 (1918).

✱

The Biochemical Activity of Agglutinating Bacteria.—Experiments with *B. paratyphoid B* and cholora vibriones showed that agglutination has no influence upon the general biochemical properties. The quantity of products of the chemical reactions of the bacteria are the same in both the agglutinated and nonagglutinated cultures. The agglutination does not influence the reproductive activities of the bacteria.—Amilcare Zironi, *Atti accad. Lincei,* 26, II, 19 (1917).

✱

Specific Reactions of the Body Fluids in Pneumococcic Infections.—Specific agglutinins usually appear in the serum of patients with pneumonia during or just after defervescence. The agglutinins in the serum seem to persist longest in Group I, for a shorter time in Group II, and for the shortest time in Group IV. The urine contains specific precipitable substances or precipitins. The spinal fluid in cases of pneumoccoccic meningitis also contains precipitable substances similar to those in the urine, but neither agglutinins nor precipitins. The precipitin reaction may be applied to the spinal fluid in pneumococcic meningitis as a practical means of rapid classification of the infection.—C. C. Hartman, *Jour. Immunology,* 3, 43 (1918); *Chem. Abst.* 12, 1313 (1918).

An Antigen for use in Complement Fixation in Tuberculosis.—The tubercle bacilli are isolated from sputum and grown on Petroff's medium. The organisms are scraped from the surface of the medium placed in a covered sterile open Petri dish and dried over night in the incubator. The mass is then ground for four hours in a mortar. Gradually saline solution is added until an even emulsion is obtained. Sufficient saline is added to obtain a 0.5 per cent suspension. Phenol is added as a preservative. —M. S. Fleisher and G. Ives, *Jour. Lab. Clin. Med.*, 3,302 (1918).

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Cultivation of the Meningococcus under Partial Oxgen Tension.—A method by which meningococcus cultures may be easily obtained in sufficient quantity for rapid agglutination has long been sought. Experiments showed that much better growth in primary cultures is obtained under partial tension conditions. It is quite difficult to get ærobic strains from partial tension ones. Ærobic strains when split off from partial tension ones have a tendency to remain ærobic, and do not grow at all well in lower pressures of oxygen. A simple method of partial tension plating for the isolation of meningococci from mixed cultures is described. Relatively few meningococci are capable of ærobic growth.—M. B. Cohen, *Jour. Am. Med. Assoc.*, 70, 1999 (1918).

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The Presumptive Test For B. Coli.—The new Standard Methods of Water Analysis of the A. P. H. A. recommend one per cent lactose for the lactose broth medium. In the presumptive test such an amount is detrimental, as many strains of *B. coli* die off rapidly after twenty-four hours. A reduction of the lactose to 0.5 per cent reduces this error and is therefore recommended by the author for routine tests. For a rapid confirmatory test, the modified eosine-methylene blue agar may advantageously be substituted for litmus-lactose agar or the Endo medium in routine water analysis, because of its simplicity, ease of preparation, and the differentiation which it permits between *B. coli* and *B. aerogenes.*—Max Levine, *Jour. Am. Water Works Assoc.*, 5,169 (1918).

⁂

Chemical Tests for Salvarsan and Neosalvarsan.—Tentative standards for these preparations have been adopted by the Federal Trade Commission on the recommendation of the U. S. Public Health Service, but these do not appear to meet all exingencies. It is for this reason and for the purpose of better defining the properties of good preparations that the work of compiling the qualitative and quantitative tests has been undertaken.—C. N. Myers and A. G. Du Mez, *U. S. Public Health Reports*, 33, 1003 (1918).

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Preliminary Agglutination in the Isolation of Typhoid and Dysentery Bacilli from the Excreta.—The author urges the method of preliminary agglutination as more simple and economical than those in general use. The technic and the advantages of the method are fully described.—William Fletcher, *Jour. Royal Army Medical Corps*, 30, 500 (1918).

⁂

The Stability of an Alkaline Hypochlorite Solution.—From experiments made it is evident that an alkaline solution of hypochlorite is not much more stable than bleaching powder, and is of little use as a stable sterilizer in tropical countries.—A. F. McCulloch, *Jour. Royal Army Medical Corps*, 30, 522 (1918).

⁂

A Comparative Study of the Efficacy of the Various Agar-Dye Mediums for the Isolation of Typhoid and Dysentery from Feces.—Peptic liver digest agar is a better substratum for the isolation of organisms of the typhoid-dysentery group from stool and urine specimens than veal infusion or meat extract agar. For the primary isolation of typhoid or paratyphoid organisms from stool and urine of patients or carriers, the eosine-brilliant green medium of Teague and Clurnan can be highly recommended, when properly prepared with peptic digests. This solid medium permits the detection of a higher percentage of viable typhoid bacilli than any other one thus far introduced into bacteriologic technic.—K. F. Meyer and J. E. Stickel, *Jour. Inf. Diseases*, 23, 48 (1918).

⁂

A Method for Obtaining the Growth of Anærobic Bacteria.—The method has been found useful for obtaining the growth of anaerobic bacteria directly from discharges from wounds, without requiring any special apparatus. Ordinary tubes of 20 per cent neutral gelatin are used, to each of which a cube of beef or veal, measuring about 2 cc. has been added before the final sterilization. The tubes are inoculated freely with the material to be examined, and are incubated at a temperature of 37s 3C. Both, ærobic and anærobic bacteria, if present, grow freely, and pure cultures are isolated in the usual way. The medium is suitable for the subculture of anærobic species.—E. S. Harde, *Comp. rend. de la Soc. de Diologie*, 806, 661 (1917); *Review of Bact.*, 7, 146 (1917).

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Results of Prophylactic Inoculation Against Pneumococcus in 12,519 Men.—At Camp Upton 12,519 men have been vaccinated against Pneumococcus Types I, II and III. Three or four doses were given at intervals of five to seven days with a total dosage of six to nine billion of Types I and II and four and one half to six billion of Type III. During the ten weeks that have elapsed since the vaccination, no cases of pneumonia of these three types have occurred among the men who had received two or more injections of vaccine. In a control of 20,000 men there were twenty-six cases of Pneumococcus Type I, II and III pneumonias during the same period. The incidence of Type IV pneumonia and streptococcus pneumonia was much less among the vaccinated troops than among the nonvacciriated. It remains to be determined how long the immunity persists.—Russell L. Cecil and J. Harold Austin, *Jour. Exp. Med.*, 28,19 (1918).

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An Experimental Study of Vaccination Against Bacillus Dysenteriæ.—The purpose of the investigation was to determine a practical method of vaccination against bacillary dysentery. The toxicity of the dysentery group can be diminished by the addition of almond oil. As a result of the slow absorption of the dysentery bacilli from the oily suspension only slight local and general reactions follow, and it is possible to give at one time and in a single dose a sufficient number of the killed dysentery bacilli to incite a high degree of immunity.—Peter K. Olitsky, *Jour. Exp. Med.*, 28, 69 (1918).

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Laboratory Detection of Carriers of Meningococci at the Laboratory of the U. S. Naval Training Station, Great Lakes, Ill.—Detailed description of method used in the diagnosis.—C. W. Barrier and R. M. Choisser, *U. S. Naval Medical Bulletin*, April, 1918.

The Preparation of Colloidal Gold.—Detailed description of method of preparation required to obtain a satisfactory solution.—Frederick G. Speidel, *U. S. Naval Medical Bulletin*, April, 1918.

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Sensitized Vaccines in the Prophylaxis and Treatment of Infections.—The chief objection to the general use of sensitized vaccines is the increased labor and time necessary for their preparation. At the present time it would seem desirable to limit their use to the treatment of infections in which there is a hypersensitiveness to ordinary vaccines or in which the latter have proved inefficacious.—R. L. Cecil, *Am. Jour. Med. Sciences*, 155, 781 (1918).

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The Circulation of Arsenic in the Cerebro-Spinal Fluid.—Of the 123 cerebrospinal fluids collected at intervals ranging from five minutes to twenty-three hours after injection of from 0.3 to 0.6 gm. of arsphenamin, 38 showed appreciable amounts of arsenic. The largest amount was 0.6 gm. of arsenous oxid in 1.0 cc. The average amount was 0.18 mg. per cc. In general, those patients showing the larger amounts of arsenic in their fluids made the more rapid improvetions of divided doses at one or two hour interment. It is suggested that intravenous injecvals would prove more effective in maintaining a high concentration of arsphenamin in the blood for longer periods, and thus possibly allow increasingly greater amounts to pass into the perivaxcular spaces.—John B. Reiger and Harry C. Salomon, *Jour. Am. Med. Assoc.*, 71, 15 (1918).

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Annual Meeting, A. P. H. A., Chicago, Oct. 14-17.

Come, and Bring a New Member.

STORIES FROM THE DAY'S WORK

Contributions to this section are invited.—*Editor.*

ONE WAY OF GETTING BETTER BIRTH RECORDS.

Norfolk, like all other cities, has been suffering greatly from the lack of birth records. Recently, many laws, the most important of which is the Child Labor Law, have come into effect in Virginia and many other states, which require a proof of age in the event that a child under fourteen years of age wants to go to work. We have always found it well-nigh impossible to secure adequate birth records, but I recently hit upon a plan that has worked wonders in Norfolk, practically doubling our birth reports. For many years Norfolk had reported regularly month by month more deaths than births; now our reports show about two births to every death.

We organized, what is known as the "block system," or a house-to-house survey throughout the entire city. The King's Daughters, the Housewives' League and a number of church women's organizations co-operated, totalling about 500 women. I had slips printed, and city was divided into twenty districts, twenty-five women to each district. They visited every house in the city, and secured the name, age, and place of birth of each child under five years of age, together with the names of the parents and the doctor or midwife who officiated at birth. We collected about 10,000 of these records; then, however, came the real job—to check off those that had been reported, and to secure legal birth records of those who had not. We did this, however, and found perhaps 2,000 or more unreported births.

These ladies in making their visits left literature in each house setting forth the importance of having their children registered. Of course every doctor in the city quickly learned what we were doing and this being a check upon them they have come across with their reports. We found quite a number of doctors who had not reported their own children.

The first campaign of this kind was conducted two years ago. We put a second into effect this spring. We find the ladies quite interested and they really enjoy this work.

To health officers: If your records are shy on births, try this stunt.

P. S. Schenck,
Health Commissioner, Norfolk, Va.

UNSAFE ICE.

Last summer, I made a survey in a southern community, the ice supply of which was manufactured locally by the can process. The water used for freezing was pumped from a river which received the raw, untreated sewage of the community. This pumped river water was purified by a double distillation followed by boiling, which would give a safe product. The ice itself, however, I did not consider safe for this reason: The purified water was put in cans and allowed to freeze. The resulting cakes of ice were loosened from the can by allowing warm, raw, river water to flow over the outside of the can. This was done by a hose held in the hands of a negro workman. The temperature of the water was not high enough to kill *B. typhosus.* This was proved by the fact that the workman held the hose in his naked hands. As this water was played up and down the sides of the can some of it entered and worked its way down between the ice and the can. Additional water entered the can from the playing hose as the cake plunged out. Each can contained probably one-half pint to a pint of this sewage-laden water which, of course, entered into the conposition of the next cake of ice.

Ice of this type may actually be more dangerous than a grossly polluted product, for the words "distilled water ice" give a sense of false security which puts the consumer off his guard.

W. L. Dodd,
Met. L. I. Co. Survey, New Orleans, La.

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THE PROGRAM OF THE WAR DEPARTMENT AGAINST VENEREAL DISEASE.

Wm. F. Snow,
Lieutenant-Colonel, Medical Corps, U. S. A.
and
W. A. Sawyer,
Major, Medical Corps, U. S. A.

Read before the Conference of State and Provincial Boards of Health, Washington, D. C., June 5, 1918.

I. Lt.-Col. Snow.

I THINK my part in the discussion of this problem should be simply to introduce Major Sawyer and Doctor McLaughlin by a few remarks. In the development of the present campaign against venereal diseases some of us have played the part of the woodsman who is sent out into the mountains to mark a roadway. He goes over the mountain and, so far as he can, follows a straight course. In later years when the road begins to be extensively used, a surveyor follows the trail blazed out and says, "What a miserable trail! Why didn't he follow along the stream? With only a little blazing here and there he could have made almost a straight course." In defense of the fellow who went first it may be said that he could not see the stream all the time, or it looked to him at times as if the river made a big bend and it would be shorter to climb the mountain side.

The surveys have now been made and the scientific building has begun in earnest. Since the advent of war last year we have seen more progress than in the last thirty years, during which people have steadily made efforts in this direction with increasing confidence in ultimately achieving success. So far as the government is concerned, its work has all been directed along three or four major lines. When I say the government I mean all of the departments of the government, because this is a problem which cannot be handled by any one department. The army has, of course, distinctly the largest problem because it has so many hundred thousands of our men under its control. The navy has a corresponding proportionate responsibility. The Public Health Service has the responsibility for the civilian industrial population. The American Red Cross has come forward in a splendid way to coöperate with these several agencies. The United States Bureau of Education is trying to reach boys graduating from the high schools who will be in the next draft. The United States Children's Bureau is going back into the homes in a most effective way, making plans to reach the children who are now growing up to be the next generation of men and women who will rule this country. All these are just an extension of lines of coöperation, so that when we speak of the government we ought to include all these agencies.

The outstanding features of the practical problem which is presented to us are, first, the detecting of cases, second, the treatment of those infected. Besides providing facilities for treatment for those already infected, the government feels we ought to do all we can to educate and aid those who are not infected to protect themselves.

That brings us to the educational factor and all its ramifications. In every other communicable disease, there are certain difficulties attendant upon an individual's applying the knowledge he has of protection from disease. None of us, for instance, who are susceptible to bubonic plague, can protect ourselves if we don't know that bubonic plague is in the city and we are being exposed. And even if we do know that fact, we cannot do a great deal to protect ourselves unless the health authorities and the collaborating agencies do something to aid us in the control of disease.

In venereal diseases we have essentially the same problem and are finding, as we deal with the venereal diseases from an epidemiological point of view, that public opinion is with us. The controversy between medicine and morals is not really controversial if we look at it squarely. It

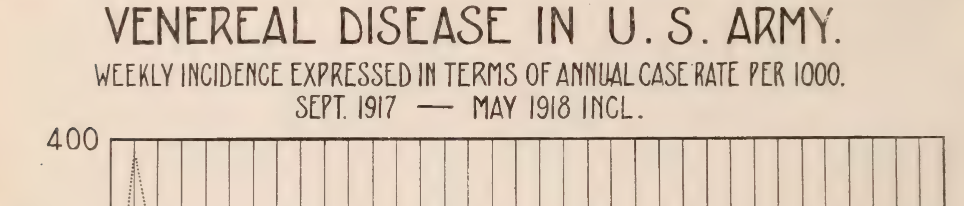

Chart 1. Annual venereal disease rates per thousand men in the National Army, Regular Army, and the National Guard, and Expeditionary Forces by weeks for the period from September 21, 1917, to May 24, 1918, incl.

is simply a question of utilizing a new type of public health machinery. Instead of using the sanitary engineer to drain a swamp as we do in malaria, we have to use the lawyer and the social worker in controlling liquor and prostitution and other evils. The analogy is scientific enough and the public is beginning to see it.

II. Major Sawyer.

MAJOR SNOW has spoken of the principles underlying venereal disease control. I shall exhibit a few charts which show the extent of the venereal disease problem in the army and which point out where, from the viewpoint of the army, the greatest emphasis should be placed in the control of these diseases.

The first chart shows the amount of venereal disease in the National Army, the National Guard, the Regular Army, and the American Expeditionary Forces from September, 1917, up to the present.

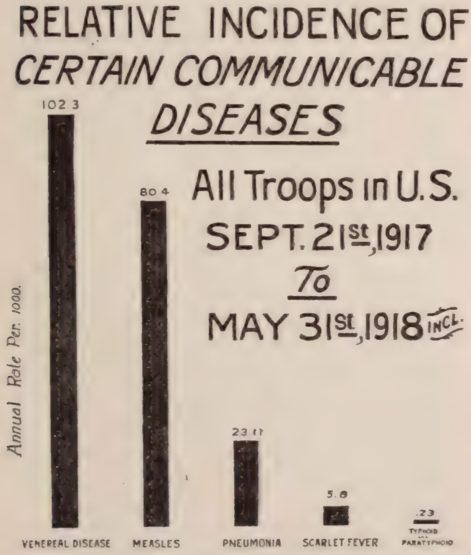

Chart 2. Comparison of the annual rates per thousand men for all troops in the United States between September 21, 1917, and May 31, 1918, of certain of the more important communicable diseases.

This chart gives an idea of the magnitude of the problem with which the army is dealing. It does not show how much venereal disease is being contracted by the soldiers, nor the exact percentage of the men having venereal disease at the time of admission to the army. The fluctuations vary principally with the number of new men admitted to the army, and therefore cannot be used to measure the success of preventive measures in or around the camps. The high points of the curves coincide with the large increments of drafted men.

In interpreting the curves it should be kept in mind that the figures represent the annual rate per thousand men figured for the given week. The annual rate must be divided by fifty-two to find the actual number of cases per thousand men reported for the first time during any week in question.

The second chart shows the incidence of venereal disease in the army, as compared to other important communicable diseases. As General Gorgas has said, venereal diseases present the greatest communicable disease problem of the war. They are the greatest single cause of disability in the army.

The third chart shows the amount of

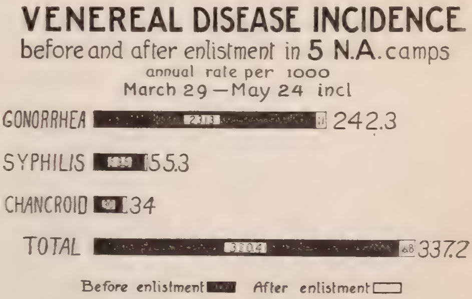

Chart 3. Annual rates per thousand men, before and after enlistment, in five National Army Camps, Dix, Lee, Upton, Meade, and Pike, for gonorrhea, syphilis, chancroid, and total venereal disease, based on 37 special weekly reports from March 29th to May 24th incl.

venereal disease contracted after enlistment in five National Army camps, contrasted with the total amount. Figures for the whole army are not now available, and would probably not show quite so marked a contrast.

In these five camps there were about nineteen times as many cases contracted before enlistment as afterward. It is, therefore, the disease contracted by civilians before enlistment, under civil conditions, which is reponsible for the disability due to venereal disease in the army. To reduce the small amount of venereal disease contracted after enlistment is the problem of the army. To cut down the vast amount brought in from civilian life is the problem before the state and local health officers throughout the United States. There is no greater or more urgent health problem before them today. To solve the whole problem, the army and the health officers will need to exercise the closest coöperation.

At the beginning of the war it was expected that conditions around the camps would become serious. The War Department Commission on Training Camp Activities was organized to prevent this, and it has received splendid coöperation from most communities. The activities of the commission have been a large factor in the low amount of venereal disease contracted after enlistment. For carrying on the work of preventing venereal disease through the enforcement of laws against liquor and prostitution, there has been organized a law enforcement division of the commission. This division has had assigned to it a corps of twenty-six officers of the Sanitary Corps of the army. They assist in the enforcement of Federal, state, and municipal laws against vice and liquor, with much emphasis on the repression of prostitution. This work, and the educational work carried on among the soldiers by the commission and the medical officers of the army, strike at the source of venereal disease and have proven highly effective in those communities in which intensive work has been carried on owing to their special importance to the army. State and local health officials will have to take the lead in venereal disease control throughout the length and breadth of the nation, if big results are to be obtained and if the disability in the future drafts is to be materially reduced. The nation cannot afford to hand over to the army such a great burden of venereal disease arising needlessly in the civilian population.

Taking the country as a whole, very little can be done in venereal disease control except through the state and municipal officials, particularly the health officials. I am glad to say that the army's request for public health control of venereal diseases is getting a wonderful response from state and municipal health officials. When the Surgeon-General informed health officials of what was needed, the great majority were willing to assist to the fullest extent within the limits of their power.

The state boards of health are putting the control of syphilis and gonorrhea on a sound public health basis. In thirty-four states and one territory venereal diseases must be reported. In eight states the report is by name; in the remainder by physicians' office number. In twenty-three states and one territory these diseases are required to be quarantined when necessary to protect the public health. In eleven states separate bureaus of venereal disease have been established. In fourteen states and one territory, in which venereal diseases are required to be reported by office number, the name of the patient must be reported if he fails to continue treatment or to observe precautions to prevent spreading disease.

The quarantine of the venereal disease patient when necessary to protect the public health has proven practical and has doubtless already prevented many infections. Quarantine of all cases is not necessary and is distinctly impractical. The method which is becoming generally accepted is similar to that which has been advocated for tuberculosis, another chronic communicable disease. The incorrigible and dangerous patient is quarantined under proper treatment in a hospital, and kept from exposing others. In the control of venereal diseases, the method is more important than in the prevention of tuberculosis. The provisions for quarantine are the teeth in the venereal disease statutes and regulations.

Venereal disease control should be kept a matter of public health administration free from unnecessary court procedure.

The establishment of separate bureaus of venereal diseases by state boards of health puts these diseases in a class with tuberculosis, as far as special recognition is concerned. Venereal diseases as a group are more destructive and preventable than tuberculosis, and it is therefore right that they should receive attention from a special staff with special funds.

I have heard it said that we should be able to reduce venereal diseases by fifty per cent in a few years if the present program can become general and be efficiently administered. I believe it is true, and that further reductions can be made in subsequent years, until syphilis and gonorrhea have reached an incidence as low as that of typhoid fever at the present time, or even lower. We know as much about venereal diseases as about the other preventable diseases. The laboratory part of the plan is well worked out. The methods of control are being successfully carried on in extra-cantonment areas. Why not in the rest of the country?

We have been dropping silver nitrate into the eyes of the babe to prevent gonorrheal ophthalmia, but we have been doing almost nothing to prevent the father or mother from contracting the original infection and bringing it into the home. It is only since the war began that we have considered relative values of the methods of controlling venereal diseases, and have recognized that we must get at the large sources and use law enforcement and educational measures to reduce prostitution and make the transfer of infection much less frequent.

The success or failure of venereal disease control depends on the vision and energy of the health officer.

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Bacillus Influenzæ Absent in Present Pandemic.—The world is being visited with a rapidly spreading disease that resembles influenza. Captains T. R. Little, C. J. Garofalo, and P. A. Williams of the Canadian Mobile Laboratory No. 1 have investigated numerous cases among the troops, both clinically, bacteriologically, and by the use of other laboratory tests. They find that the disease resembles influenza clinically with certain differences however. The symptoms are sudden chills, severe headache, pain in cervical, dorsal and lumbar regions, pain in limbs and general malaise. Fever occurs and soon reaches its maximum. The fever generally varies from 990 to 1020. After the second day, there is an abrupt crisis, and at the end of the fourth day the patient is normal again. The course of the disease is shorter than in influenza, and the gastro-intestinal symptoms are slighter.

Samples of the exudates from the upper air passages were examined as smears, and by the cultural method. A small, Gram positive diplococcus was found in large numbers. The Bacillus influenzæ was always absent. The organism was grown on legumin serum agar and was unable to ferment dextrose, levulose, maltose, lactose, saccharose or mannite. It had a slight tendency to anærobic growth.

The disease is not characterized by a sharp leucocytosis or polynucleosis.—*The Lancet*, London, July 13, 1918. (*M. P. H.*)

PROTECTION AGAINST FOOD CONTAMINATION.

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TO say that food inspection, other than milk inspection, has not received adequate attention from municipal health authorities, particularly in the smaller cities of this country, is not to reveal a secret. It is generally conceded by those best informed that inspection as a protection against food adulteration or misbranding is of relatively minor importance in the actual prevention of disease, and municipal health authorities whose funds for disease prevention are too often insufficient, are quite justified in curtailing such activities as are not of established health benefit to their communities. There are, however, certain phases of food inspection work which are productive of real and demonstrable health benefits, and as such should be included in the health program wherever possible. Leaving out of consideration, then, food inspection for the prevention of adulteration and misbranding, the health value of which is at least not proven, and milk inspection, the value of which is unquestioned, there remains a considerable field of food inspection work which merits further development. Applying the test of prevention of disease to activities in this field, we may define several very important procedures which any municipal health officer may carry out at small expense, and the results of which may be readily demonstrated. These procedures are:

1. The physical examination of all food handlers, and the exclusion from food handling of those having communicable diseases, which may be conveyed in food to food consumers.

2. The inspection at slaughter of the carcasses of animals used for food purposes, and the exclusion from sale of such carcasses, or such portions of them as are unfit for human consumption, by reason of disease contamination.

3. The inspection of methods of food handling to prevent the contamination of food with disease organisms, through unclean methods or by unclean workers.

The reason why such procedures have not been properly developed is two fold, namely, inadequacy of appropriations for health work, and the failure of municipal health officers to develop information which will indicate to appropriating bodies, the need and value of the services mentioned. It is the rule for municipal health officers to lay the blame for inadequate service upon inadequate appropriations,—but it is a fact that appropriations for health work are usually in direct proportion to the aggressiveness of the health officer, and his ability to convince the holders of the purse strings and citizens in general, that greater expenditure will guarantee better health. The health officer who initiates new activities and proves to his community that such activities mean certain benefits, rarely has difficulty in securing support for the extension of his health program. The purpose of this paper is, therefore, to point out how the food inspection services suggested may be organized and developed, so that the municipal health officers may not only provide the service necessary, but also develop information which will convince the citizens of his community that the service is necessary.

As regards the physical examination of food handlers, information is already available to establish the importance of the procedure. In the cities of New York and

Chicago, in the states of Pennsylvania and Indiana, and in the Panama Canal Zone, physical examination of food handlers has demonstrated that there is an actual menace to the public in the handling and preparation of food by persons suffering from communicable diseases. In New York City, where the health department has been making physical examinations of food handlers since 1915, of 1,980 cases intensively examined at its occupational disease clinic, 10 active cases of tuberculosis, 19 active cases of syphilis and 6 active cases of gonorrhea were discovered and excluded from food handling. In addition 15 cases of arrested and suspected tuberculosis and 32 cases of suspected syphilis were discovered and placed under observation for periodic examination. It was found in this study that of 41 cases of active and suspected syphilis, 30 were among waiters. Of 695 waiters examined, one in every 23 either had syphilis or was suspected of having the disease, and one in every 63 had an open case of syphilis. The indicated incidence of syphilis among waiters was $3\frac{1}{2}$ times that among males in all other food handling occupations. The high incidence of syphilis among waiters is, as the report of the New York City health department points out, a matter of serious concern.* Certainly the physical examination of food handlers is indicated as an important part of the municipal health program, and the facts already available are sufficient to support the demands of a health officer for funds with which to provide such examinations. The fact is, however, that little attempt has been made by municipal health authorities to carry out the necessary procedure. In the majority of cities, the municipal health officer learns of the existence of communicable diseases only through the reports of physicians or others, but since in many cities tuberculosis and typhoid fever are badly reported, and syphilis and gonorrhea not reported at all, his sources of information regarding the incidence among food handlers of these readily transmissible diseases are far from complete.

In the smaller cities, a beginning at least in the physical examination of food handlers can be made without great expense. First, of course, a law is needed which will require that food handlers in certain employments shall not be employed except on presentation of a certificate of health from the local health authority. This is often a matter of local ordinance or regulation only, because of the broad powers granted local authorities by state health laws for the prevention of communicable diseases. The next step is the devlopement of an organization and procedure for enforcing regulations, and there is no great difficulty here. Almost every municipal health department has one or more competent physicians employed on full or part time, and by proper readjustments of their schedules of work the necessary examining service could be provided. In the beginning, in order to minimize the work requirement, examinations should be made of food handlers by groups, as the waiter group, the cook group, the baker group, etc., and the groups should be examined in the order of their importance. The waiter group should be the first to receive attention, since this group has been found to have a high incidence of communicable disease, particularly venereal disease. As the work is extended, the need for additional workers will be demonstrated, and the health officer should have at the end of six months or a year, sufficient data to give weight to his requests for increased funds for extension of the work if necessary. He would certainly receive the approval of the citizens of the community, once they were made cognizant of the facts. If no health dangers were demonstrated by the examinations, the health officer would at least know that he had done his duty and could then turn his attention to other matters.

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* See the Health of Food Handlers (Monograph series, Department of Health of the City of New York, August 1917), by Dr. Louis I. Harris, Chief of Division of Industrial Hygiene of the Department of Health, and Louis I. Dublin, Ph. D., Statistician, Metropolitan Life Insurance Company.

The inspection at slaughter of animals intended for food purposes, the second item of importance in a program of food inspection for the prevention of disease, is another problem of food inspection service which is neglected or ignored entirely in many cities of the United States. Most large cities have a meat inspection service, socalled, but such meat inspection is ordinarily concerned with the inspection of meat in local markets or shops. Of more than twenty cities in which the author has had an opportunity to observe conditions, and in which meat inspection is not chiefly provided by the Federal authorities, only three are making satisfactory efforts to inspect animals at slaughter. Yet it is certain from the evidence submitted by the Federal meat inspection service, not only that the protection of the public health demands inspection of animals at slaughter, but also that any other method than inspection at slaughter fails to meet the need.

The chief difficulty experienced by municipalities in providing adequate meat inspection service, is in controlling the small slaughter houses, which are usually many, and in the inspection of so-called "farm-killed" animals. To provide a force sufficient to inspect slaughtering at a score or more small abattoirs, scattered throughout the city and its environs, and to inspect the occasional slaughtering for local sale on farms throughout the country, would require an expenditure of money which would perhaps be prohibitive for many cities. The alternative, is then, to reduce the field, so that satisfactory inspection can be performed by a smaller force. The first step in reducing the field is to bring about if possbile the coöperation of operators of small abattoirs, and the consolidation of many abattoirs into a few for which a competent inspection service may be provided. In this connection, the decision of the United States Supreme Court in the famous "New Orleans Slaughterhouse Cases," which upheld the right of the state or municipality to pass laws requiring the slaughtering of animals within prescribed limits and in certain definite places, is well worth review by municipal health officers. On the basis of this decision, it would be proper for a municipality to prohibit slaughtering except in a prescribed place or area. Two other courses are open, namely, the enforcement of a regular schedule of hours of slaughtering in the small abattoirs, so that a large number of abattoirs may be supervised by few inspectors, or the establishment of a municipal abattoir.

We shall not attempt in this paper to discuss the merits of the municipal abattoir plan. There is, however, opportunity to improve the efficiency of meat inspection, even when no consolidation of small abattoirs can be brought about, or where the establishment of a municipal abattoir is not practicable for one reason or another, by regulating the days and hours of slaughtering in small abattoirs so that even a small inspection force will be able to visit all establishments and inspect slaughtering in all. If the days and hours of slaughtering are not so regulated, it is obviously impossible for a small force to control the situation. Slaughterhouse proprietors, if left to their own devices, will slaughter when they feel reasonably certain that an inspector will not be on hand, either very early in the morning or very late at night, when it is difficult for an inspector to be assigned. One middle west city, which has a very satisfactory meat inspection service, has worked out an excellent inspection schedule for approximately sixty small slaughterhouses supplying local markets. In thirty small slaughterhouses where killing was done three times a week, the hours of slaughtering were so scheduled that an inspector was present at all such times. In addition, there were about twenty-nine slaughterhouses where killing was done only occasionally and the inspector visited these places only on call. The meat inspection force included a chief veterinarian inspector and eight assistants, two of whom were assigned to full time duty in the large abattoirs. The total force therefore available for inspection in the small abattoirs, comprised only seven men, but the work was done very satisfactorily because of the carefulness with which time schedules of slaughtering and the assignments of inspectors were worked out. In smaller cities, the number of slaughterhouses would of course be less and the inspection force required proportionately smaller.

For controlling the inspection of "farm-killed" animals, that is, those slaughtered by individual farmers on their premises, a large western city has adopted a plan which works well, and is one which could be adopted successfully by practically all small cities. A city inspection station is provided, to which all carcasses, not otherwise inspected at the time of slaughtering, are brought for inspection before being sold to local dealers. A veterinarian is stationed at this inspection office and stamps as approved, or condemns all carcasses brought to the office. Since no meat is allowed to be sold in the city unless it bears the stamp of the approved inspection, and a heavy penalty is fixed for violation of the regulation, there is little attempt on the part of the dealers to evade the law.

No matter what plan of control is put into effect, adequate local regulation is necessary in order that no meat shall be sold or offered for sale within the city which does not bear the stamp of the local meat inspection service, the Federal meat inspection service, or some other municipal meat inspection of approved standard. The penalty fixed for violation of this regulation, should be high enough to be a real deterrent and if enforced rigidly will produce results. Any one of the suggested plans of meat inspection can be put into effect in any municipality without great cost. If fees for the inspection of carcasses are required, meat inspection service should be largely self-supporting.

Comment on the necessity for inspection of the cleanliness of employees, utensils and methods in food establishments, the third essential of a food inspection program, should be not necessary—but it is necessary because in so few cities is the matter given intelligent attention. To enforce cleanliness in hundreds of establishments scattered throughout a city is obviously a very difficult task, but not an impossible one if an inspection force is properly directed and an effort made to reduce the field as far as possible. First of all, there must be a proper code of regulations for the guidance of inspectors and these regulations should state specifically what should and what should not be permitted in food establishments. On the basis of such regulations, the approval of the health authority should be required before a license is granted to the establishment (and all food establishments should be licensed). Such approval should be granted only after inspection, and scoring of the establishment by an inspector. If the establishment fails to come up to the minimum standard established, it should not be approved and no license should be granted. The scoring of establishments for approval of licenses and the subsequent scoring of such establishments should be done by the use of a score card, and in devising such a score card careful thought is necessary. The score card should require the inspector to observe whether or not the minimum essentials of the regulations are observed, by a series of stated questions which should require very definite answers, and a numerical weight should be given to each question, based on the relative importance of the regulation from a public health standpoint. Too often score cards, though filled out by the inspectors with the best intentions in the world, do not give a clear picture of conditions, nor enable the reviewing authority to determine the status of the establishment as complying with or not complying with regulations, because the score card has not been based wholly on the regulations. It is not a good plan to leave the determination of standards to the judgment of the inspector and to permit him to classify the establishment according to his opinion as "good," "fair," or "bad." These terms mean nothing more than mere opinion, unless it has been determined beforehand what "good," "fair" or "bad" mean. Otherwise one inspector, badly trained, may designate as "good" an establishment which a better trained inspector would certify as "bad." If the regulations require that foods be covered to prevent contamination by dust and dirt, whether they are covered or not is a fact which can be answered by the inspector with "yes" or "no." If the regulations require that the establishment be properly screened against flies, it either is or is not so screened, and the inspector should say "yes" or "no." If the regulations require proper toilet facilities and equipment for workers, and their use by workers, the facts as to the adequacy and use of such facilities should be set forth. In short, there should be a question covering each regulation which the health authority deems essential, but no question regarding matters which are not covered by regulations. If the regulations are deficient in requirements they should be amended.

Having adequate regulations and a score card properly devised, the next step is to determine the point of attack. Little is gained by permitting inspectors to go about making hit or miss inspections without definite plan or objective. A complete registry of food establishments should be made, and if all food establishments are licensed, as they should be, this will be easy. All establishments should then be classified as groceries, restaurants, bakeries, etc. This having been done, a determination should be made of the group to be first inspected. Observations of conditions in many cities indicates that the most serious conditions of uncleanliness are found in restaurants, and this group should perhaps be the first to receive attention. Each restaurant should then be inspected and scored and, according to the numerical score, each establishment should be rated as A, B, C, or D,—A grade representing establishments with a rating of 90 to 100, B those from 80 to 90, C those from 70 to 80, and D those from 60 to 70. Establishments scoring under sixty should be refused license or their licenses revoked. When all establishments have been inspected, scored and graded, the score cards should be filed by grade as A, B, C, or D. To all A grade establishments a blue certificate or merit should be granted, and to all B grade establishments a red certificate. No certificates should be granted to C or D grade establishments. The educational value of the granting of such certificates is apparent, and its effect is invariably to stimulate competition on the part of the proprietors of the establishments.

When all inspections of establishments in each group have been made, the scores and grades established, and the score cards filed by grades, the next step is plain. The obvious point of attack is upon those establishments rated as D and C, and efforts should be made to raise the grading of these establishments. Instead of having inspectors going about making more or less routine inspections of all establishments, their attention could be directed immediately to those places where conditions are bad and a menace to public health. If these places are improved and raised to a higher standard, it is quite possible to measure the efficiency of inspectors by the results of their work. It is not possible otherwise. Once the above system is established and put in operation, the field of inspection, the effort required, the cost of service and the menace to the public should continually grow less, and these, of course, are the objects desired.

It may be well to point out the more important features of inspection of food establishments, for the prevention of food contamination through unclean methods, practices or habits of food handlers. The need for physical examination of food handlers has already been pointed out, but it is quite possible for a food handler of unclean habits to become a real menace to public health even though he may be in good health. It is practically impossible to control the food handler who is wilfully unclean, but experience shows that the cleanliness of food handlers is usually in direct proportion to the facilities for cleanliness provided, and their education and training in the use of such facilities. Food regulations should therefore require that food establishments be provided with proper toilets equipped with closets in good working order, and with adequate supply of water for flushing. Hot and cold water for washing purposes should be required, as well as soap and paper towels, so that food handlers may have no excuse for failing to take advantage of their opportunities for cleanliness. In all such toilets, proper placards should be posted setting forth the necessity for cleanliness of habits,—and it should be the duty of the inspector to educate food handlers to a proper conception of the relation of cleanliness to public health.

That foods should be protected against their promiscuous handling by customers goes without saying, but comparatively little attention is paid to this matter by municipal health authorities. Typhoid carriers are not by any means uncommon, and the connection between the fingers of an unclean typhoid carrier and a subsequent case of typhoid, can be readily established even though it may not easily be demonstrated. The protection of food from promiscuous handling by patrons of food establishments should, therefore, be required in regulations and guaranteed by inspection.

The elimination of the fly menace in food establishments is another important factor in the prevention of dangerous food contamination, and the elimination of this menace is dependent chiefly upon the prompt and proper disposal of wastes. The disposal of food wastes, and the proper screening of food establishments, should then be matters covered comprehensively and definitely in regulations and in inspectional procedure.

If inspection of food establishments is worth while, and in the opinion of the author it is decidedly worth while, it should cover completely and thoroughly the above features of food handling—and for the sake of emphasis they are restated in brief:

1. Provision of proper toilet facilities for the use of employees, and the education of the employee in the use of such facilities.
2. Protection of food from promiscuous handling by patrons of food establishments.
3. Elimination of the fly menace by prompt and proper disposal of wastes and proper screening of food establishments.

These should be the minimum aims of inspection of food establishments. There are, it is true, other phases of such inspection of some importance, but if the efforts of inspectors are concentrated upon those named, results in health protection can be secured even though the measure of resulting benefits may not be so readily demonstrated statistically. There will, however, be apparent to citizens, a cleanliness and wholesomeness in food establishments which will merit their decided approval.

To sum up the argument of this paper, it may be said, that the chief need in food inspection service is for intelligent direction of inspectors and the concentration of effort on work which is productive in the prevention of disease. This requires, first, proper organization of the food inspection force; second, definite and specific regulations covering each part of the program; third, instruction of inspectors in the procedure to be followed; fourth, assignment of inspectors according to a result producing plan; and fifth, the concentration of effort where the need is greatest. If these things are done, the measure of the value of food inspection work in the prevention of disease may be estimated. The reason why it cannot be estimated now is because health authorities have not directed their work to this end. If food inspection other than milk inspection is not productive in community health, then it is about time all health departments turned their attention to other work. If it is productive in health benefits then it should become a feature of the health program in every city.

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Classes for Undernourished Children.—The following is a summary of methods used in conducting classes for undernourished children at Bellevue Hospital.

When a child enters the class his general history is recorded, including the diet he has been receiving, the time he sleeps, the length of time spent out-of-doors, etc. A complete physical examination is made. A social worker gets the social and economic facts which have a bearing on the case and which may have a direct relation to the condition of malnutrition in the child. A printed slip giving instructions in hygiene and a diet list are then given the mother. We have a food exhibit of artificial foods showing the day's ration arranged in the form of three meals. By quickly changing the plates we show how one article may be substituted for another of equal caloric value. This graphic demonstration serves to impress the facts on the mother's mind. It also serves to emphasize the importance of properly selected, well cooked and well served food. Nearly all of the portions represent 100 calories of the various articles of food, but we do not say much about calories in attempting to teach these ignorant people as we have found it better to show them definite meals, arranged in amounts proper for a child.

We give our instruction by means of class talks to the mothers, using wall charts and showing them what makes a child gain in weight and what makes him lose. We have a weight chart for every individual child, and collective weight charts showing the weight curves of every child in the class. There are also sheets for home records, and each child is supposed to keep this record showing just what he has eaten, how many hours he has slept, how much time he has spent out doors and exercising, when his bowels have moved, etc.

At first the children return each week to be weighed and examined; later they come only once in 2 weeks if they are progressing favorably, and the interval between visits is gradually lengthened as they approach a normal weight for their ages. By this class method the child has his attention directed to the faults of others, and profits by them, and a spirit of competition is aroused which can be used with advantage.—Smith, C. H., *Archives of Pediatrics*, XXXV, No. 7, p. 428. (*D. G.*)

ICE CREAM EPIDEMICS AND MODEL REGULATIONS FOR CONTROL.

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THE manufacture of ice cream in the United States is now to be classed as one of the larger industries. The many and intricate machines for its manufacture, the costly plants using these and the enormous resultant output speak plainly of the growing importance of this great industry. Health officials have not paid the attention they should to this industry and any progress has been largely due to the wonderful desire of ice cream manufacturers to make for the good of the trade. Some states and cities are alive to this vital issue and others are daily awakening.

An excellent history of the industry is to be found in "Principles and Practice of Ice Cream Making" by R. M. Washburn, published by the Vermont Agricultural Experiment Station.

One problem that is today an open issue between the manufacturer on the one hand and the health official on the other is the question of food value of ice cream. The former largely consider it a confection, the latter are inclined to the idea that it is a food. The voice of the sanitarian and food chemist is heard in the report of the Commission on Milk Standards in the Public Health Reports, Vol. 32, page 285. The general trend of the claims of manufacturers is manifest in a booklet, the "Brief on the History and the Present Meaning of the Term Ice Cream" compiled by C. G. Child and published by the National Association of Ice Cream Manufacturers. Whatever the arguments it is certain that ice cream is an ever-increasing article of diet, particularly in the summer months, often being the main or only nourishing part of a lunch.

Chemical analyses of ice cream, usually for its fat content, are to be more generally found in municipal health laboratories than are bacterial analyses and constitute what one man terms, "Examination from the side of the pocketbook rather than of health." Careful supervision of ice cream factories by local health authorities is highly desirable. Bacterial analyses are readily made in any laboratory where the ordinary apparatus is at hand and score cards may be used for inspections. (Bulletin, 563, U. S. Dept. of Agric., Bureau of Animal Industry, "The Determination of Bacteria in Ice Cream.") One need hardly call attention, however, to the uselessness of Sanitary Regulations without adequate provision of machinery to enforce them.

With a full appreciation of the growth and development of ice cream manufacturing in the United States the author undertook the task of finding out by means of questionnaires, sent throughout the United States, the approximate number and intensity of epidemics due to ice cream in this country. At the same time an effort was made to find out what means were taken of sanitating the processes and factories.

It is not proposed to make an extensive review of the literature on this subject but as an example of epidemics in other countries the general findings of Dr. G. F. Buchan (1910) in England are here given. (Journal of Hygiene, Vol. 10, No. 1, page 93.) In all he records eight epidemics and one case of ptomaine poisoning. Of the epidemics one was scarlet fever, one was of an unknown nature, two were cases of Gaertner infection, and four were typhoid. In only one case, a Gaertner infection, was the organism actually isolated. Some were traced to the cream, while others were traced to illness in the home of the vender.

As to our own work there were ninety-one cities from all parts of the United States which replied. Eight of these provided inspection of ice cream establishments, five depended entirely upon the state, while four coöperated with the state. Seven reported epidemics and five food poisonings from eating ice cream. Where such inspections are left wholly to the state the best conditions apparently cannot prevail.

A brief summary of the epidemics and poisonings reported as being due to the eating of ice cream is here given.

Epidemics.

At Perth Amboy, N. J., in 1913, there was an epidemic of eighty cases of typhoid fever undoubtedly due to the eating of ice cream. Mr. W. H. MacDonald of the State Department of Health, and William J. Wilkey, health officer of Perth Amboy, traced the trouble to a wholesaler. The wholesaler purchased from many producers but pasteurization remedied the difficulty.

In 1917 about twenty-five cases of typhoid fever took place in St. Louis, Mo., as a result of eating ice cream at a private dance. This of course could not be definitely traced, due to the time taken for the incubation of the disease, but there seems to be little doubt.

In 1915, at Gallup, N. M., a typhoid outbreak was traced to a dairy selling milk and cream. Subsequently at Holbrook, Ariz., two cases of typhoid broke out which were traced to the eating of ice cream made from the infected cream shipped from Gallup. Doctor Bazell of Holbrook traced the Arizona outbreak.

During the summer of 1914 there occurred fifty cases of typhoid fever in the Park Slope district of Brooklyn, N. Y. The New York City Health Department traced this epidemic to a certain establishment where those affected had eaten ice cream. A careful inspection of the place failed to disclose the cause.

In the spring of 1915 nine cases occurred in the same district, and were traced to the same establishment. Another investigation was made, this time with greater success, for a carrier was found.

The same department traced an epidemic of twelve cases of typhoid fever in South Brooklyn to a definite location, an ice cream parlor, and a chronic carrier was found.

At Newport, R. I., there was a

rather serious outbreak of diphtheria of milk origin. (Public Health Reports, Vol. 32, page 1787, Oct. 26, 1917.) It became quite evident from the investigations of Surgeons McCoy and Bolton of the United States Public Health Service and Doctor Bernstein of the State Board of Health that ice cream, which was made from infected cream, was the carrier of the disease to most of the infected persons. Visitors to Newport, as well as inhabitants of neighboring towns, were affected. All gave a history of having eaten some of the infected ice cream, used the cream, or were contacts. Of four hundred and two cases recorded there was only one death.

Other epidemics are known to have occurred in various parts of the country, particularly small ones in the South. Among the larger epidemics that have been reported is one in Pennsylvania. This was typhoid, from a contaminated milk supply.

POISONINGS.

Under this head are given those illnesses which resulted from the eating of ice cream but which did not require any prolonged period of incubation. The use of the term "ptomaine" as a blanket for the unknown is not readily permissible. It is by no means certain that any of these poisonings are the result of alkaloidal products of bacterial activities on proteins, but they may be due to changes taking place in the material as a result of bacterial activity following ingestion.

At Lynn, Mass., a number of persons, including a physician, were affected with the usual symptoms of ptomaine poisoning as the result of eating ice cream. A thorough investigation by the local Health Board failed to disclose any conclusive evidence.

At Rochester, N. Y., ice cream eaten at a picnic resulted in the illness of about forty people. A chemist failed to isolate any alkaloid that would be considered specifically poisonous from the sample submitted to him. Dr. G. W. Goler, health officer of Rochester, carefully investigated the affair but did not find any definite and conclusive cause.

In 1914, Dr. E. C. Chipman of New London, Conn., reports thirty or forty cases of poisonings as the result of ice cream eaten at a picnic in Waterford. All recovered. Two controls, shut in children, in different families, one ate the cream with cake and was ill, one ate the cake only and was not ill.

In May, 1914, several cases of poisoning occurred in Kewanee, Ill., due to the eating of ice cream from at least two manufacturers. Investigations were conducted by Doctors Crawford and Klein and Mr. Gaskell. Cases always followed shipments from a certain creamery, which was above question. A certain producer supplying this creamery had very unsanitary conditions. By eliminating this source from the Kewanee supply the trouble was stopped. The trouble occurred again in Galena where the cream was used.

Many of these epidemics of poisoning are said to have caused nausea, vomiting, cramps, diarrhea and collapse. It is interesting to note that an outbreak of similar form in New Jersey was traced to a cow suffering from an udder infection of an unidentified streptococcus. (Public Health News, Vol. 1, page 102. New Jersey State Board of Health.)

Other cases of poisoning from ice cream eating have from time to time been reported as due to refrozen ice cream or the result of metallic poisonings from freezers. It is to be doubted if any of these have been proven, especially the latter.

Discussion.

From the reading of these epidemics one can see that in so far as the ice cream industry is concerned its sanitation consists in (1) the use of ingredients with a clean sanitary history, (2) the use of properly cleaned utensils and a clean factory, and (3) the proper handling of material by individuals with a clean bill of health.

In the first case the milk and cream are the worst offenders and may be controlled by the pasteurization of the raw products. This may either be done at the plant or only products of such a nature purchased. Fortunately the ice cream manufacturers take kindly to this and have installed plants for this purpose. Any change in viscosity of cream so treated is easily restored by a twenty-four hour storage at a cold temperature.

The second is to be controlled by frequent inspections. Score cards help chiefly as reminders. Helpful coöperation accomplishes more than a long list of prosecutions, but when the latter are required they should be quickly and quietly made.

The third requires regular and careful inspections of all workers, for gonorrhea, syphilis, typhoid, tuberculosis, sore throat, skin diseases and the like. Persons suffering from temporary colds or other like minor ailments should not be permitted in the making or handling rooms. Health officials should be as helpful as possible in this matter and inspectors should call for an inspection of health certificates.

With the foregoing facts in mind, and also as a result of a careful examination of various state laws and local ordinances, the author has composed a model and comprehensive set of rules and regulations relating to the manufacture, storage, and sale of ice cream—as follows.

Manufacture.

A. Ingredients.

1. All milk, cream, condensed milk, homogenized cream, and skimmed milk used in the manufacture of ice cream shall have conformed to all the requirements for use as a food as contained in—(here give exact references to laws and ordinances).

(Pasteurization is to be recommended.)

2. No water, fruit, fruit juice, pastry, condiment, flavoring, coloring matters, sugars, gums, gelatines or other substances shall be used which are not pure and wholesome, and free from any injurious substances.

3. The use of melted ice cream after refreezing, or mixing is prohibited.

4. The finished product shall contain not less than — per cent butter fat as determined by the Babcock Test and be free from all preservatives and products of decomposition.

5. The finished product shall not contain bacteria in excess of—(allow slight excess over milk) when determined by growth on plain-nutrient agar (+1) at 37° C. for forty-eight hours, platings and dilutions to be made with all materials at 37–40° C.

B. Utensils.

1. All utensils which come in direct contact with the liquid ingredients or the frozen product must be of non-absorbent, non-poisonous materials.

2. All utensils must be thoroughly cleansed with fresh boiling water and soap after each time used.

3. All utensils kept ready for use must be free from dust. All selling and shipping utensils must be sterilized or rinsed in clean boiling water after each time used.

4. No utensil used in storage of ingredients, making, storing, or transporting of ice cream shall be used for any other purpose.

C. The Factory.

1. All walls, floors, and woodwork must be impervious to water, free from cracks, crevices, projections, or other dust and dirt-collecting places.

2. The drainage must be such as to permit easy flushing and rapid carrying away of the water from the floor which must be kept clean at all times.

3. The factory must be above ground.

4. The lighting arrangements shall permit an adequate supply of sunlight during the daylight hours.

5. No ice cream shall be manufactured in a kitchen, washroom, workshop, sleeping room, stable, or in close proximity to a room used for any purpose than that directly related to the manufacture of ice cream. Where rooms of this kind adjoin they shall be so partitioned off that direct communication is impossible.

6. Adequate toilet facilities shall be provided. These shall be partitioned off from every part of the factory and not directly communicating with any making or handling rooms.

7. There shall be constantly available during the working hours a good supply of hot water, soap and clean towels, conveniently placed with facilities for washing the hands.

8. The factory shall be free from flies and other insects. It shall also be free from odors not directly connected with the industry.

9. The ventilation shall be such as to secure an adequate supply of air, free from excessive dusts.

D. Individuals in the Manufacture and Handling.

1. All persons engaged in making or handling ice cream or of the utensils used in the process must be free from all forms of contagious disease.

2. No clothing shall be worn by those engaged in the making or handling of ice cream that is not washable and in a clean, fresh condition.

3. The bare hand or absorbent material shall not be used in manipulating the product in any way.

E. Storage and Transportation.

1. All ice cream must be held at a temperature below 20° F.

2. All ice cream must be kept only in closed containers.

3. A new batch shall not be packed on top of an old one.

4. Cabinets and tubs shall be properly drained at all times.

5. Wagons, cars, and other means of transportation shall be in no way unsanitary.

F. Sale.

1. All persons engaged in handling ice cream for sale must meet the same conditions as those engaged in its manufacture.

2. All places where ice cream is offered for sale must meet the same requirements as those for the place of manufacture.

3. All utensils for serving must be washed with clean hot water after each time used. Sinks are prohibited when kept filled with water for repeated washings.

4. All surfaces on soda fountains, counters, draining boards, ice boxes, tables and places where drinks and refreshments are served shall be non-absorbent and frequently washed with *scalding* water.

5. All refuse in refreshment booths, soda fountains and ice cream parlors must be kept in closed receptacles emptied and scalded at least once daily.

FEEBLEMINDEDNESS AND SOCIAL ENVIRONMENT.

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EVERYWHERE, from earliest prehistoric man up to our most complex international politics of today, the essence of our problem then was and is now biological, and if we adopt the inductive methods of psychology we can build on a solid foundation our social ethics, since as explicitly stated by A. F. Tredgold, consulting physician to the National Association for the Feeble-Minded: "Whatever may be the relation of mind to brain it is now fully recognized that the manifestation of mental activity is indissolubly connected with the cells of the cerebral cortex. Mind develops *pari passu* with their growth and fails with their decay." When John Stuart Mill urged that "Every man is a part of nature and subject to its laws as causation," we can agree that morality becomes necessarily social and based on man's relations to his environment, both human and non-human, since he is subject to the law of causation the same as Nature around him, and that as man evolves socially it will mean the rythmic activation of all his energies toward one common end, namely, the liberty to will and to do in the pursuit of the highest good.

Accepting for ourselves biology as the basis of our experimental psychology, there rests upon us the peculiar duty of becoming the apostles of a social ethics, which ought to determine men's activities from those of the mere individual up to the highest functions of the state, and yet: How many of us have consciously adopted any such social creed? How many are convinced for instance in our communities that the greatest good in an election is not associated necessarily with the party having the longest purse? How many parents have such clear ideas of their duty to the state that they are prepared to be inconvenienced in their pleasure by rearing a normal number of children? How many are willing to sacrifice their personal comfort or profit, it may be, through living in a smaller community or even in the country in order that they may rear a robust family of children for the state? Or finally how many have ever given serious thought to the problem of how we can best conserve our energies with a view to transmitting to the coming generation those high physical, mental and moral traditions of the Anglo-Saxon race which have distinguished this continent for three centuries?

Much has been written about what statistics prove, especially for the last half of the nineteenth century, as regards the superior people, especially of the New England and Atlantic States, in the matter of a birth-rate decline, amounting to a positive lessening of the population equilibrium of the old Anglo-Saxon stock; while intellectual Brahmins and cultured bluestockings have boasted rather of their superiority to biological laws, or perhaps even believed in their ability to create higher and superior ones, when as a matter of biological certainty the egotism that boasts itself thus betrays an egoism which Dr. Nordau cleverly demonstrates as being but an early evidence of degeneracy. I do not remember to have met anywhere a more vivid picture of the effects of certain social conditions amongst the old eastern people than that contained in a study by Miss E. H. Irwin regarding certain families in a westside school in New York City. The study states that this Fifty-third Street school was chosen "because it was largely composed of American born children, many of whose parents are American born."

"This neighborhood of first, second and third generation Americans is in strong contrast to the more familiar eastside, where a foreign born population swarms the streets and a strange language meets the ear from every hand. On the eastside, teeming dirt and teeming life struggle for the uppermost. On Fifty-third Street, neither the dirt nor the people are so overpowering; life is more sluggish and poverty more gaping. The contrast is as between watching one race of human beings clambering up a hill that is hard and rocky and steep, yet ever making progress as against another slipping back into a quicksand, struggling without hope and ever losing ground. Ambition is replaced by indifference, expectation by despair. In an immigrant neighborhood one hears constantly of the future of children, their education, their already begun success; but here what glory there is exists as a left-over recollection of the past generation, of better conditions during the childhood of the parents, of wealth and power, growing brighter in the memory as this goes on. One hears too the constant echo of that sentiment of defeat that 'Times are not what they were' and that 'things grow worse every day.'"

I feel quite certain that many old physicians from different parts of America can recall in their experience similar groups out of which have come one or several families betraying more or less markedly the stigmata of degeneracy. We have no time to analyse such, but several characteristics seem to stand out most markedly in them and of these I shall put first *mimetism.* Mimesis we define as imitating or aping the gestures or voice of another, or of his manners or actions; while anyone who has studied the phenomena of hypnotic suggestion will see in its subjects various characteristics, which remind us of perhaps what is most marked in feeblemindedness, namely, the ease with which a person is influenced through suggestion or mimetism. The imbecile echoes immediately your suggestion that black is white or that two and three make four, and when we come to the higher type of moron we recognize the same dominating influence of some proximate suggestion, influence or example. Translated into exact terms it means that there is absent, or more or less permanently quiescent, the determining influence of conscious mind or "the will"—viz., the cultivated mind which instantly discriminates, determines or wills, and keeps in the background the activation of the emotional or automatic—that is the subconscious mind. We say feeblemindedness is in effect marked by lack of comprehension, judgment, discrimination—in a word of ratiocination. As expressed by Nordau: "To this is added the unfailing weakness of will of the degenerate person, which makes it impossible for him to control his obsessions, to resist his impulses, to control his fundamental moods, to keep his higher centres to the attentive pursuit of objective phenomena."

Without analyzing further the psychological phenomena of feeblemindedness we have after three generations under modern conditions an opportunity of judging somewhat of the influences of social conditions upon mental phenomena. The grandmothers of our race in America had a dozen children, labored hard, and often lived till ninety years. In the year 1790 but 131,472 persons in the United States lived in towns, or less than 4 per cent in 3,929,214 population. Thus we see that in a century the urban population increased over a 1,000 per cent, or over ten times from 4 per cent to 46 per cent of the total population of the United States, in cities of 2,500 or over.

As a result of this urbancy alone Dr.

Nordau says, "All these increased activities, however, even the simplest, involve an effort of the nervous system, a wearing of the tissues. Every line we read or write, every human face we see, every conversation we carry on, every scene we perceive through the window of the flying express sets in activity our sensory nerves and our brain centres." The logical outcome of this cerebration carried to an abnormal degree is neurasthenia, with which all observers associate the psychopathic basis of epilepsy and insanity and predominantly feeblemindedness, since Tredgold expresses the absolute view that environment directly impresses itself upon germ plasm, affecting it in one or more determinants, which if increased by mal-environment in the first generation extended to the second or third is cumulative in a degeneracy, increasing till idiocy is the result. The anatomical basis is, as Tredgold states, that of an inherited instability, defective metabolism and tendency to premature degeneration of nerve cells, the actual exciting cause of disease being supplied by toxins or by any of the numerous forms of stress and strain incident to modern life. What some of these are is sufficiently indicated by subjects dealt with in the many papers presented in the different sections of this annual Public Health Congress. Reverting, however, to the question of the origin, education and development of the mind and will as growing out of its experiences it will be apparent that we have forces inimical to the evolution of mind operating from two opposite poles. The one is where external impressions are wholly wanting, and the other where their impulses succeed each other so rapidly upon the eye, the ear, the nose, skin and so on as to prevent any well defined and conscious image being stamped upon the central nerve cells and so result in an insensibility to impressions almost as unfortunate as where no impression, whatever is present. It is idle, indeed, to expect conscious perceptions, ideation or thought if either no distinct perceptions rise into consciousness or, even if developed, no time for linking up associated groups of ideas in thought is given owing to constantly fresh and new external impulsions too rapidly impinging on some special sense. But oddly enough while on the one side these multiplied sensations too often result in an inattention and even an unconsciousness of them,—a necessity, indeed, to prevent the brain from absolute exhaustion through attempting too long to co-ordinate multiplied sensations—there results on the other hand through an abnormal hyperaesthesia often developed when such environment as just mentioned is maintained, an unhealthy, clamant demand for something to tickle or temporarily satisfy the irritable, unstable, automatic brain centres, often approaching the state of the exhaustion of dementia. This is illustrated in the case of many feeble-minded children, who move almost constantly when awake in a purposeless manner from one thing to another and whose attention it is impossible to fix for more than a moment.

When we consider the numerous variations of the mental objective or purpose in the millions of individuals in great cities it seems hopeless to analyze the activating forces at work in them; but they resolve themselves as a matter of fact, into a few main groups whose effects we may study. For instance the home environment of a purely physical character is much the same for hundreds of thousands, differing perhaps mostly in the size of rooms and the amount of air space, in the amount and extent of warmth and sunshine. To this we may add the degree of cleanliness and the amount and character of the food supply. The sights impressed on the eye are the same for most, being chiefly walls and rows of houses often in shadow, defective sunshine and street scenes of every sort with indeed much the same sounds, both in quality and amount. In the streets the means of locomotion are the same and at a little later age the objects which impress themselves, from the newsboy shouting his cries to the food vendors, become the chief mental impressions from this external world and are much the same for all people. Similarly at school, the kindergarten, the lessons in class, the mode of teaching, the drill and calisthenics are everywhere the same forming a type of education, common in fact to millions of minds in a great city like New York. Succeeding this a few leading papers continue the educative process for those who are old enough to read and from illustrations like "Buster Brown" to the last striking expression of the baseball reporter, the mind of the adolescent American is being padded out only to be completed by the transient presentation of an underworld, which has for many hitherto only been hinted at in newspapers, but is now visualized through concrete illustrations in the "Movies."

If I am right then it is inevitable that thought—the product of mind which groups through association individual impressions, repeated until they rise into consciousness and there become concepts, which through differentiation become well defined ideas—must primarily deal with those material issues which fit the city dweller to cope with his immediate environment and in the great mass of the people cannot receive adequate impressions and evolve ideas regarding affairs, foreign to city life and still more regarding problems which are world-wide or supra-mundane. Remembering that at least 80 per cent of the population of our cities are dependent upon a daily wage, utilized almost wholly for their immediate wants, and that they are influenced directly, physically, mentally and morally by their social environments, we need not wonder if a type of feeblemindedness is the outcome, relatively common when compared with those in a population brought up in the open with Nature supplying daily her wholesome sensations in a normal environment.

Remembering, too, that the mind, made up of presentations from infancy of a city world around it, is incapable of displacing such readily and of receiving those from natural objects foreign to it, we can see how, where as in the United States 12,000,000 were added between 1900 and 1910 to a city population of 32,000,000, the difficulty of our problem increases enormously with every decade. How we are to check the degenerative process or antidote the tendency seems to me to be one of the problems toward which the chief energy of public health workers everywhere today must be specially directed. To illustrate, as I write this millions in New York City are shut within its walls with a plague almost as mysterious as that of Athens in the days of Pericles as described by Thucydides, while the strike of thousands of car men and the threatened strike of five hundred thousand railway employees are each so many assaults upon emotional nervous systems already overwrought and exhausted in the unprecedented high temperatures of long July days, productive of malign effects upon hundreds and thousands of individuals unequal to the strain. Multiply these conditions for the many millions of people of all our great cities and towns and we are forced to ask ourselves, *Cui bono?* For what good? Are all future generations to be ever and increasingly the creatures of such environment, where the individual personality becomes almost lost or is a pawn in the game where capitalistic knights and kings hold all the moves? I cannot believe that such a fate is either necessary or inevitable in a world whose ethical progress is or ought to be ever upward. Outward and laterally into fresh air and sunshine by every conceivable means of transport,—instead of upward toward an uncertain heaven—where the hands can touch the kindly bosom of Mother Earth, plant roses in her garden and later gather fresh flowers and fruit seems to me the only solution to the problem of how we are to prevent the rapid degeneration of a race, who once had Anglo-Saxon freemen for their ancestors and were something other than automata, ever drudging and rolling a Sisyphus stone up a mountain of struggle without a top, or exhausted through the thirst of hopeless labor seeking to drink from the golden cup of Tantalus always just beyond their reach!

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A BACTERIAL EXAMINATION OF GREEN VEGETABLES.

Fred William Kurk.

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In this investigation, attention was principly directed toward estimating the presence of the coli-typhoid group, streptococci and anærobic organisms on green vegetables. Examinations were also made to determine the number of bacteria by use of agar, and gelatin plates and the number of ærobic spore formers, of gas formers in lactose broth and of molds was recorded. An attempt was made to find whether the general sanitary conditions of the store at which the purchase was made had any influence on the bacterial contents.

All samples for these examinations were purchased at various stores about Chicago, with the exception of Number 5, a sample of watercress obtained from a glass bowl containing water on a free lunch counter in a saloon.

The media were made according to the rules given in "Standard Methods of Water Examination," of the American Public Health Association.

Five organisms superficially resembling paratyphoid bacilli were isolated, but in no case did the complete cultural and agglutination reactions place them in this group.

B. coli were found on 22 out of 29 samples. Of 12 samples from stores classified as clean, 11 showed B. coli; of 10 samples from stores classified as fair, 6 showed B. coli, and of 6 from dirty stores 5 contained B. coli.

Streptococci were found on 3 samples—on 2 samples from clean stores and on one from a store listed as fair.

B. cloacæ were found on 5 samples—3 from dirty stores and 2 from stores listed as fair. The sample of green onions, Number 14 contained a great number of B. cloacæ. A week later another sample, Number 15, obtained from the same place, again showed a great number of B. cloacæ present.

Mold spores were found on only 13 out of the 29 samples.

Twenty-eight out of the 29 samples contained gas formers in lactose broth.

The total bacterial count at 37° C. and 20° C. varied widely, the former from 6,000 to 4,300,000: the latter from 18,000 to 25,800,000.

Summary: There is great variation in the bacterial counts. No direct sanitary relations in the store sampled were apparent, but it must be noted that the free lunch counter sample gave a very high colony count.

The observations do not seem to indicate that the general sanitary conditions of the store influenced the bacterial count.

TABLE I.

Sample number	ondition of store	Vegetable	Size of sample examined	Bacteria at 37° C. 48 hrs.	Bacteria at 20° C. 72 hrs.	B. coli on endo	Anaerobes.
1.	clean	celery	1 gram	26,700	liquefied	16,000	0
2.	clean	head lettuce	3×4 in.	30,200	liquefied	0	0
3.	fair	celery	1 gram	53,000	liquefied	0	0
4.	fair	head lettuce	3×3 in.	249,000	liquefied	0	0
5.	*	watercress	1 gram	4,060,000	25,800,000	2,300,000	0
6.	clean	watercress	1 gram	1,550,000	5,750,000	22,000	0
7.	clean	head lettuce	4×4 in.	116,000	plate spoiled	0	0
8.	clean	green onions	onion	3,300,000	plate spoiled	1,120	0
9.	clean	lettuce	4×4 in.	178,000	plate spoiled	60	0
10.	fair	head lettuce	4×4 in.	6,000	18,000	0	0
11.	fair	leaf lettuce	4×4 in.	12,000	102,000	0	0
12.	clean	leaf lettuce	4×4 in.	480,000	2,800,000	970	0
13.	fair	celery	1 gram	1,800,000	4,400,000	640	0
14.	fair	green onions	onion	2,400,000	8,600,000	0	0
15.	dirty	green onions	onion	2,580,000	4,200,000	6,200	0
16.	dirty	celery	1 gram	700,000	740,000	3,600	0
17.	dirty	leaf lettuce	4×4 in.	88,000	1,600,000	0	0
18.	clean	green onions	onion	18,000	25,500	300	0
19.	clean	celery	1 gram	68,000	132,000	600	0
20.	fair	leaf lettuce	4×4 in.	640,000	2,100,000	0	0
21.	fair	green onions	onion	4,300,000	3,200,000	450	0
22.	fair	leaf lettuce	4×4 in.	470,000	650,000	700	0
23.	fair	radishes	radish	1,530,000	1,040,000	2,200	0
24.	clean	leaf lettuce	4×4 in.	940,000	1,200,000	4,000	0
25.	clean	radishes	radish	340,000	760,000	1,000	0
26.	clean	watercress	1 gram	320,000	350,000	100	0
27.	dirty	leaf lettuce	4×4 in.	260,000	360,000	300	0
28.	dirty	head lettuce	4×4 in.	640,000	600,000	460	0
29.	dirty	celery	1 gram	1,200,000	1,660,000	160	0

* Watercress from free lunch counter.

TABLE II.

Sample number	Gas formers in lactose	Mold colonies	Streptococci	Aerobic spores	Kinds of bacteria identified.
1.		20	0	1,700	B. coli, B. subtilis, B. aerogenes, Cladothrix.
2.		0	0	300	B. coli, B. aerogenes, B. subtilis.
3.		0	0	3,600	B. coli, B. aerogenes, Cladothrix.
4.		0	0	1,360	B. coli.
5.		100	0		B. coli, B. paratyphosus A.
6.		160	0		B. coli, B. prodigiosus.
7.	2,000	0	0	3,100	B. mesentericus, B. subtilis.
8.	5,000	0	0	2,200	B. coli, B. subtilis.
9.	200	0	0	30,000	B. coli, B. mycoides.
10.	0	0	0	300	B. mesentericus, cladothrices.
11.	20	40	0	400	B. cloacae.
12.	2,000	0	0	4,500	B. coli, B. subtilis, B. prodigiosus.
13.	2,000	20	0	700	B. coli, B. fluorescens.
14.	10,000	0	0	2,200	B. cloacae in large numbers, B. subtilis.
15.	10,000	0	0	6,300	B. coli, B. cloacae.
16.	10,000	60	0	4,400	B. coli, B. cloacae.
17.	20	0	0	2,400	B. subtilis, B. mesentericus.
18.	2,000	200	+	1,800	B. coli, B. subtilis, streptococci with small cocci, green mold.
19.	10,000	0	+	8,700	Streptococci with large cocci, cladothrices.
20.	200	0	0	4,100	B. mycoides, B. fluorescens.
21.	2,000	20	0	2,200	B. cereus, B. coli, B. mesentericus.
22.	200	0	0	650	B. coli, B. subtilis.
23.	5,000	100	+	1,750	B. coli, streptococci.
24.	5,000	60	0	1,800	B. coli.
25.	2,000	700	0	3,400	B. coli.
26.	200	0	0	2,800	B. coli.
27.	2,000	20	0	1,800	B. coli, B. mesentericus.
28.	5,000	0	0	3,800	B. coli.
29.	200	80	0	3,200	B. coli, B. cloacae, B. subtilis.

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THE PUBLIC HEALTH INSTRUCTOR—A NEW TYPE OF HEALTH WORKER.

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THE steadily increasing demands of the military service for graduate nurses has caused a situation in the nursing service of the country that is as acute as the medical situation.

This scarcity of nurses has been felt in public health work with increasing severity. The supply of new material has been directed to army service with ever increasing speed. County nurses have left their fields, and municipal and industrial nurses have enlisted in military service in such large numbers, that public health work has been handicapped by the loss of trained workers and unable to fill their places by recruiting of newly graduated nurses. Communities have, through long campaigns of education, been at last brought to realize the need of the service of the nurse and social worker, and have been induced to cheerfully make appropriations for their support, and now when ready to provide for such service are unable to secure it.

This situation has been realized, with great concern by the Wisconsin Anti-Tuberculosis Association, which has been very active in urging the importance of the county nurse, and the public health nurse, as great factors in the development of better health conditions among the people of the state. Wisconsin is preeminently a state with a rural population, and the Anti-Tuberculosis Association has devoted a very large part of its efforts to the improvement of rural health conditions. As part of this effort, it has for the past three years conducted twice yearly, a course of instruction for training public health nurses.

This course has been conducted in the city of Milwaukee, and has been limited to graduate nurses who were desirous of preparing themselves for public health work. More than fifty nurses have taken the course, and these nurses have been placed widely throughout the state, and the Association has thus come to be regarded as a clearing house for communities desiring such service. The experience obtained in conducting these courses, as well as careful study of the work they have been doing, joined to a careful analysis of the ideals and aims of public health nursing, has brought about a deep-seated conviction that the work of the public health nurse is fundamentally educational in its scope; that her work must be primarily and emphatically directed to the purpose of awakening the public mind to its increased responsibility in matters of health; that she must be the leader of health movements in her community; she must be emphatically a teacher, if she is to realize the aim of true public health progress.

In order to accomplish this aim, the nurse must be thoroughly trained in the theoretical knowledge upon which the control of disease is based, and must understand widely and broadly the fundamental problems of preventive medicine. She must know, and thoroughly understand the problems of tuberculosis, infant hygiene, and school inspection; she must be familiar with the problems of pure food and proper living.

To secure this information, she must take graduate courses after completing her training and, there, must be trained in the fundamentals of social service. The courses for public health nurses given by the association have endeavored to meet these ideals and give them instruction in these subjects.

With the realization of these needs, and stimulated by urgent necessity, realizing that three years is necessary for the training of the nurse, and that thereafter a post graduate course is often necessary, it has become apparent that some shorter method of preparing health workers, who at the same time will be competent and qualified, must be found.

The solution of this problem has been found in The Public Health Instructor. The Public Health Instructor is not a nurse; she is not a teacher (as we commonly understand that term); she is not a social worker; but is a combination of all the functions of these classes, directed solely to the accomplishment of the public health ideal; she is not a nurse, for she will have no training whatever in the technique of bedside nursing. Her instruction will not be given in the hospitals. She will not be taught surgery, materia medica, gynecology, etc. Yet she will have intensive and thorough and complete instruction in the principles of preventive medicine. She will know how disease is caused and how it is spread. She will be made thoroughly familiar with the possibility of extending the term of life by right living. She will know the problem of infant mortality, and cancer prevention. She will be instructed in the effect of pure water, good food, and fresh air upon longevity of human life. Likewise, her instruction will show her the importance of relieving the remediable defects of early childhood, and their retarding influence on mental and physical development. These and all the other elements that may result in making her completely the master of the problems of life conservation and extension, will be thoroughly and completely taught her, so that her entire thought will be governed by the ingrained overpowering importance of these subjects.

She is not a teacher, in the sense that she will proceed to a school, and conduct a class in formal health instruction or "hygiene," though it is part of the conception of this new type of worker that she will be qualified to do this, and that she may actually do it in some communities. But she is a teacher in that her whole duty is to pass on both by example and precept, the knowledge that she has already learned. She is a teacher in that every act of her service in her community shall be directed to the making clearer the reasons and need for the practices that she teaches. Her sole function as a public health worker is to increase the understanding of her community in better and saner methods of living.

She is not a social worker in the sense that her function consists in investigating and correcting the living conditions of people whom she sees; nevertheless, this duty will engage a large part of her time and attention. Her instruction will teach her the importance of the family as the unit of community life, and the causes that result in the destruction of family life, as well as the means by which the family whether disintegrated through vice, crime, drink, poverty, disease, or other cause may be restored to usefulness and self-respect. She will be taught how to make use of social agencies, juvenile courts, detention homes, protective associations, charitable aid or county relief associations, mother's pensions, blind relief, little mothers' classes, homes for dependent children, war time compensation, handicapped workers and Industrial Welfare Associations.

Some instruction in elementary first aid as well as thorough drill in Publicity methods will be taught, and likewise elementary instruction in Anatomy and Physiology will be attempted.

These elements describe the theoretical

side of the instruction of this new type of worker. This, however, comprises only a part of her instruction and indeed the greatest importance is laid on the side of practical experience. This is to be gained by actually doing the various types of health work in the actual field. At first this pupil will accompany an experienced worker as an observer. This will be continued for several days after which she will be assigned cases for individual solution. These will be of increasing difficulty until at last she is adept in the branch of field service, when the practice will be repeated in another department. This field service will require a full half of the time of the worker, and will be divided into periods of four to six weeks of daily work in school inspection, child hygiene, tuberculosis, communicable disease, rural sanitation, industrial welfare, etc.

The most significant point of this course, however, is the enormous saving of time that is to be accomplished. Admission to the class is only by invitation in this first course, the membership is to be limited to women of social vision and with a desire to be of service to their country and community, and the number in the class will be restricted to those that can be accommodated by the opportunity to do real field work. Bearing in mind the supreme importance of the teaching side of the great public health problem, the choice has been limited to women who have evinced ability as instructors, and who have broad vision of what the movement means. The members of the first class have been selected from among college graduates, normal school graduates, and experienced teachers who have been individually recommended by people qualified to pass on their suitability to undertake the work. By intensive training, their class will be ready in ten months' time, and will be fully qualified to go into their various communities to take up service and help to relieve the acute situation which has thus arisen, and at the same time release for military service the graduate nurse.

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SOME PUBLIC HEALTH LESSONS OF THE WAR.

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Chairman's Address, Public Health Administration Section, Read at Washington, D.C., October 17, 1917.

SUCH general subjects as camp sanitation, protection of food supplies, precautions against the spread of epidemics and matters of a like kind are, after all, only our familiar public health problems of every day life transferred to a different environment, and while the carrying out of these measures under the peculiar conditions of modern warfare is undoubtedly more difficult in many respects than the carrying out of the same measures with the civil population, we have as an offset to this the increased authority and the more liberal appropriations coming from greater appreciation of the importance of protecting the lives and health of our soldiers.

In problems of the kind just referred to, I think I am safe in saying that we have actually learned nothing of great importance from developments along public health lines during the war and up to the present time. What we have gained is the awakening of a very considerable proportion of all the people to the importance of public health work and to its possibilities, not in a theoretical direction, but as demonstrated by actual accomplishment.

All of us have realized the great change and the broadened outlook on public health work which have come to sanitarians within the past few years. Up to quite recently the highest ambition of public health workers was to show each year a diminished morbidity and mortality rate from certain named diseases. If a public health officer could show that in the brief period of his incumbency he had cut the typhoid death rate down to one-fifth of its former proportions and had a steadily diminishing rate from scarlet fever, diphtheria, tuberculosis, infantile diarrhœa and of infants under one year of age, he felt that he had done about all of which his scientific knowledge and practical experience were capable.

But within the past few years we have had a higher ambition. We have for some time felt that we were not doing our full duty in dealing merely with the negative side of health, but that it was most distinctly within the province of a health officer to put forth every effort to raise the vitality of every human unit in his community to the highest point of efficiency. He became no longer satisfied with the knowledge that hundreds of individuals each year survived who might but for his efforts have died of some preventable disease, but he has felt that with these survivors he must lay the foundations for robust citizens of tomorrow, and so our ideals have advanced, taking in not only the previous field of sanitation but also that of personal hygiene.

How to reach the individual, however, has been the problem. Obviously, health officers could not personally supervise the daily life of every individual in the community. We came therefore, to see the necessity for educational measures, directed both to the end of securing better understanding, and hence better support of the health department, and also of so educating the individual as to furnish him with the knowledge of how to promote his individual health and with the incentive to put that knowledge into effect. It is just in the last particular that every health officer has realized the weakness of his appeal.

The chief teachings of personal hygiene are simple, and the results of following these teachings are out of all proportion to the time and trouble involved in putting them into effect. Nevertheless, the average individual finds even these simple things irksome, and no little strength of mind is required on the part of the individual to follow, day in and day out, the positive and negative precepts of health. The actual demonstration of the results of personal hygiene is one of the greatest public health lessons of the war.

Those of us who have been in public health work, even for the past decade, have seen the strenuous efforts made by many public health workers to take advantage of popular movements, hoping thereby to secure for their teachings a degree of attention and impressiveness which they have almost despaired of gaining by direct appeal. A few years ago "conservation" was the watchword, and an attempt was made by many sanitarians to attach the cause of public health to this great movement. None too well fared the general cause of conservation, but almost negligible were the results so far as gaining in this manner a new appeal for conservation of the public health. The argument—self-evident to all public health workers—that the foremost asset of this nation, or of any nation, is a robust citizenry, was readily accepted in theory, but I have yet to hear of an instance in which this argument secured for the cause of public health more liberal financial or moral support than had been obtained by our previous methods of appeal.

More recently, the popular catchword of conservation gave way to a slowly awakened interest in preparedness. New hope arose in the hearts of many of our foremost public health workers. It was so evident that in any scheme of preparedness the human unit was most important, that we hoped at last to have found the long desired means of appeal. Summer before last we had considerable numbers of men in the various camps of our National Guard, and the wonderful results of even a few months of physical training and enforced obedience to the laws of public health worked marvels, yet the impression made on the general public was practically *nil.* Great crowds watched, returning to their home towns, groups of robust, upstanding men, models of physical vigor, and could scarcely believe that these were the same pale-faced, shambling young men and boys who had gone to camp a few months before. But there the observers stopped, and it is safe to say that not one in a hundred was moved to go and do likewise.

In the past few months—since this country entered the war—we have passed beyond the stage just mentioned. Preparedness with us now brings up a picture radically different in at least two respects from that invoked even one year ago. Then it was preparedness against a danger remote and not generally felt; now it is against a menace which, if not actually imminent, is kept from us because other nations stand between us and that menace. Then we thought of it as applying, at the outside, to one citizen in a hundred (the proportion needed to give us a million trained men); now we realize that it applies to every man, woman and child of our hundred million population.

As a result of this, it seems as if at last we have an appeal for the cause of public health which can be made to reach the masses as has no appeal which we have been able to make in the past. Every intelligent person realizes that if this country is to come out victorious in the present conflict, and if it is to enjoy any sense of security for the future, those lessons of public health which are old to us who have so long labored in the cause must be taken to heart and practised by every individual and in every community.

The psychology of this has a parallel in the past history of public health work. It is well within the last fifty years that the true foundations of our modern science of public health were first laid. Up to that time, and from time immemorial, man exerted organized efforts against disease only in the face of terrific epidemics. When the great plagues of former days were devastating nations, unlimited powers were conferred on the public authorities in the effort to check the scourge. Little as was known of just what to do, nevertheless neither money nor power was stinted in the effort to put that little knowledge into effect, but at other times health departments were either non-existent or had little to justify their existence beyond measures of civic cleanliness, and but little as a rule was done even in this direction. In other words, when fear gripped the human heart, lethargy and indifference disappeared and power and financial support were freely forthcoming.

It is even so at the present time. This fear is not fear of the plagues of bygone days. It is fear of a powerful and relentless human enemy. In spite of all new inventions and improvements in modern warfare, individual efficiency of our fighting men still occupies first place, and this efficiency has health as its very foundation. This is now universally admitted. Moreover, it is well known that efficiency in the field must be backed by efficiency of the nation in its support of those at the front, and this can be attained only by national vigor, applying to every human unit and maintained by obedience to the teachings of public health. Once this is realized, there should come universal appreciation of those things which the few of us have all along appreciated to the fullest extent, but for which our appeals have been of so little avail.

Those of you who heard the excellent address of Governor Whitman at our Rochester meeting, two years ago, may recall his statement, that already in the State of New York, the burden of debt and taxes caused by the constantly increasing demands of those activities grouped as social service, clearly pointed to the fact that a halt must soon be called. True, we were heartened by His Excellency's addendum, that when the time came for curbing these activities public health should be the last cause to suffer.

The State of New York had in no year up to that time spent as much as four hundred thousand dollars for all its public health activities, and last year slightly exceeded that amount. When we contrast this sum with the huge amounts which every nation is today spending in the cause of war, we come perhaps to the most outstanding lesson of all, namely, that any nation can when impelled by a motive sufficiently strong secure money in any amount which may be required.

Our problem, then, is how we can so appeal to the people as a whole, and to our legislative bodies in particular, as to make them see that disease is a foe always threatening, always alert, always ready to find our weaknesses and take advantage of them, a foe, moreover, against whose attacks our measures can be made efficient. Against such a foe we must adopt and enforce our own measures of protection. Armies and navies of allied powers avail us naught.

I would, therefore, urge upon every member of this Association the importance of studying constantly the reaction of the people in the strenuous times in which we are now living. We see that under sufficient stimulus, they will give thousands of times the amount of money which we need for public health work in ordinary times. Under it they will resign cheerfully, and in supreme degree, that personal liberty of action which in far less degree we have asked them to resign for efficiency in community health work. By such study, we should be able to learn somewhat of how to touch those springs of human action which arouse response. And when days of peace have come to us—peace founded on constant preparedness, with maximum human efficiency as its very corner-stone—may we not hope to have found an appeal for support, financial and moral, through which we may be enabled to give always to the people the full benefits which our science can bestow on them?

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A BIBLIOGRAPHY OF FIELD WATER SUPPLY.

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THE methods of securing water for troops have been given an added interest lately by reason of the entry of our government into the present war. Under the abnormal war conditions in any locality where large numbers of men are assembled, the matter of obtaining sufficient water of any quality may become very difficult. This shortage of water has necessitated the pumping of water through very long pipe lines; its transportation for great distances by tank ships, as in the Gallipoli campaign, or the employment of trains, motor- or horse-drawn tanks, and carriage by pack animals or the men themselves. The distribution of water to the men, and the watering of horses in such a manner as to be free from nuisance and as sanitary as possible is a subject in itself.

Some of the men and officers appear to believe that the typhoid inoculation to which they have been subjected renders safe the drinking of any water, no matter how badly polluted. If the typhoid fevers, which constitute the chief menace from water-borne disease in a large part of our country, were the only ones likely to be encountered in the war zone and on our southern border, this belief might carry some weight. The possibility of contracting asiatic cholera, amoebic and bacillary dysentery, and perhaps other diseases, makes such an idea a fallacy. Then too, deliberate poisoning of wells, as well as their deliberate defilement by the enemy, must be considered.

Under such circumstances the obviously proper attitude is to consider all water supplies heavily contaminated unless the contrary is known. Toxicological and sanitary investigations should be made as rapidly as practical and the purest supplies in the region chosen if it is possible to do so. Some means should then be employed for rendering the water safe with the minimum impairment of its palatability.

Although a great amount of work has been done on these subjects, the space devoted to water purification and examination in most of the available manuals is very small. Very few references are given to the literature which is available and which should be consulted in any attempt at a comprehensive study of the general subject of field water supply. It is this situation which justifies the presentation of the rather extensive bibliography which accompanies this paper. Some of these articles are highly interesting; some are long and detailed, while others are short notes. For the benefit of those who may have little time to devote to the subject, the more interesting papers in the collection are marked by an asterisk. The various articles have been grouped according to the chief topics or according to the subjects in which the newer or more novel procedures were advanced. There has been overlapping in the subjects, of course.

The articles on analytical methods are chiefly concerned with devising rapid processes and portable outfits. Usually the reagents have been reduced to a minimum and put up in concentrated or tablet form. Even prepared bacteriological media has been reduced to tablets, one of which is the correct size for a tube of the medium. Only articles which deal with field methods are included since it is probable that the Standard Methods of Water Analysis of the American Public Health Association (third edition, 1917) will be used as far as possible without modification.

The cantonment supplies, as well as those of the large camps, need not differ greatly, in the design or the operation, from those of the municipalities. In the field, however, the quantities handled are relatively much smaller and special purification methods are employed.

The desiderata in field water purification are many and there is some conflict among them. Their purpose is to secure universal applicability and invariable efficiency. While it is necessary, of course, to strike a balance among the various factors in judging a process, it may be well to set some of these desiderata down so that they may be kept in mind:

1. The process should be efficient in the purification of all sorts of water under field conditions.

2. The apparatus should be readily transportable—if possible without the aid of wheeled transportation.

3. The apparatus should be durable and not likely to be damaged or thrown out of adjustment by the rough treatment to which is would naturally be subjected in field service.

4. Cumbersome supplies or fuel which might become unobtainable in the field should not be required.

5. Skilled attendance should not be necessary since the skilled operators are likely to be transferred to other organizations or incapacitated in service.

6. The process should purify the water within a few minutes time, yielding a water which is not objectionable to the men by reason of its odor, taste, raised temperature or the undesirable action of substances left in the water.

Heat has long been used in field sterilization, and it is perhaps the surest available agent for the purpose. Commonly the water has been boiled at night, protected from dust, and allowed to cool until morning. Sometimes the cooling has been hastened by the surface evaporation from a moistened cloth covering or from a porous vessel in which the water was contained. Heat-exchange sterilizers, such as the Forbes, which was adopted in 1898, have also been employed. All of these devices require fuel, and the heat-exchange sterilizers require skilled attendance to keep them in adjustment. The ordinary heating process requires considerable time for cooling.

Filters of all degrees of efficiency have been employed. The candle-filters have been much used by the European armies, but the difficulty with them is that they must be cleaned every three or four days, and they are very easily broken. Moreover, the housings of the filters must be tight and it is hard to keep them so, under the pressure which must be applied.

Sand filters and cloth or sponge filters, often with auxiliary coagulation, may purify water sufficiently, but are probably most useful in preparing it for subsequent chemical treatment. The Darnall filter and the more cumbersome drifting sand filter are examples of portable filters employing coagulants.

Chemical treatment is, however, the chief dependence at the present time, and chlorine in its various forms seems to be the most common germicide. Acid sodium sulphate, permanganates, bromine and iodine are also used. The acid sulphates in tablet form (with aluminum water bottles) have been supplied to cavalry. The French circular No. 68/S of October 27, 1914, prescribes methods for the use of permanganates and iodine, although Javel water (sodium hypochlorite) is apparently preferred.

The chlorine germicides which have been employed are liquid chlorine, the hypochlorites of calcium and the alkalies as well as the more complicated chlorine compounds such as "Halazone" (para sulphondichloraminobenzoic acid). A lack of space prevents entering into the methods, often very ingenious, of applying these substances.

It is true, of course, that there has been a great deal of information derived from the experiences of our allies and even from those of the enemy. It is probable that we will learn of many new developments when the present need for secrecy no longer obtains. It may be worth while mentioning, however, that the Darnall filter and the Lyster bag are the devices of officers of our own medical corps. Col. C. R. Darnall was the first person—so far as the writer knows—to apply liquid chlorine to water purification. His experiments at Fort Myer in 1910 were reported in this journal.

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CHARTS AND MAPS AS USED BY HEALTH OFFICERS.

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Graphic methods have been used by the engineer for many years, in solving some of his most complicated problems. The advantage of the graphic solution is the fact that it is usually made automatically correct and that it shows at a glance many facts about the problem which could not be readily deduced from a strictly arithmetical solution, in that general trends may be rendered more obvious. Business men have only lately (within the last two years) begun to realize the tremendous advantages of presenting facts graphically and health officers are more and more rapidly beginning to utilize these graphic records. They do this, not alone because charts help to plan work, but also because these graphic pictures are the clearest and the easiest way to tell the story of conditions to the public as a whole. The time when curves and graphs were a puzzle to the average layman has passed. We find them being used by various firms in advertisements, and they now have been shown in exhibits on public health and other matters for many years.

It is easy, for instance, for a layman to look at a map on which he understands that a red dot or red pin indicates a death from a certain disease during a given period. From this he can readily see that the grouping of red dots is more pronounced in certain districts, than in others. He usually finds, if he is familiar with the locality, that these dots follow the grouping of the homes of the poorer types of citizens. He is also much more easily convinced that the death-rate from tuberculosis is decreasing by a curve or series of bars of varied lengths, than he would be by a table of figures.

Graphic records, too, can be used to obtain appropriations and present facts to legislative committees or to the public in such a way that these bodies are bound to be convinced and to respect the requirements.

A large telephone corporation won a suit which the government had against it for being a monopoly, largely because it showed in court an immense pin map on which the stations owned by the company were indicated by black pins. As the stations from other companies were indicated by pins of other colors, it was evident from the map that there was no absolute monopoly, because the various colored pins were well distributed among black ones.

A school superintendent once used a map to effect a most desirable condition. He knew that a new school was required in a certain district because the child population was centered there. A certain alderman, however, was anxious to sell land in another district. While the matter was under consideration, this school superintendent had a pin map made, showing the location of the home of every child of school age within the city limits. He also showed the two proposed locations for the school. This map was displayed in a store window for a long period, and the superintendent found it convenient to be handy where people could ask him questions, as much of the time as he could spare. The result was that when the matter came up for final decision, the school superintendent, and incidently the welfare of the city, won out.

In this same way, health officers can and should use graphic methods, prove their points and obtain necessary reforms. The prime value in keeping graphic records lies in keeping records that are news, not history. To be sure, records of history are interesting but they are not always immediately helpful. For this reason, methods which are quick and easy are far to be preferred to possibly more accurate and more complicated data. It is, therefore, always preferable to use every mechanical aid that is available.

As previously stated, the graphic display of facts and figures, outside of exhibits, divides itself into two classes, one of which is geographical and the other chronological. Because they are perhaps the simplest, the uses of maps will be taken up first and then the uses of charts.

PIN MAPS.

City Maps.

Plain outline maps without any coloring are by far the best for this purpose and may sometimes be obtained from the City Engineer's Department. A colored map is a disadvantage, because the color of the pins used on it do not show up nearly so well as on the plain map. A convenient size of map to handle is one about three or four feet square, but some cities use very much larger maps than this, occupying an entire wall of a room. It is better to have the scale of the map too large than too small, especially if certain sections are apt to be badly congested with cases. The scale of the map should not be over 1,200 feet to the inch if possible and 600 feet is considerably more satisfactory, unless this makes the map too cumbersome. The names of the streets should be lettered in plain type in the streets themselves if the pins are to be stuck in the location of the houses. Where conditions in the street are to be shown (such as the location of street accidents) the reverse is true, and the names of the streets should be lettered in the blocks and not in the streets themselves. While solid color is not desirable, sometimes the outlining of ward lines or districts in a tint, and the coloring of parks is helpful in quickly locating any given district.

County Maps.

Rural delivery route maps are available for some counties. These are to a scale of one mile to the inch and, being in plain black lines on white, are excellent for pin work. The U. S. Geological Survey topographic sheets are also good where available. They show the location of practically every building, all roads, streams and the contour of the ground. They are also to the scale of one inch to the mile.

State Maps.

State health officers will often find good outline maps which have already been prepared by some other state department, the state board of roads or forestry perhaps. There are available for most of the states east of the Mississippi and a few on the western side, state maps in black and white to the scale of eight and sixteen miles to the inch respectively. For states where these are not available or where a larger scale map of slightly different type is wanted, the U. S. Post Route maps are very satisfactory. These show all post offices, railroads and the distances between

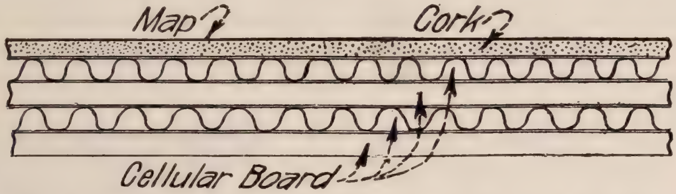

Fig. 1. Cross Section of Map Mount. This shows how the cellular board runs in opposite directions in adjoining layers to give stiffness and how the cork is placed immediately beneath the map.

stations and are good, plain maps, the only coloring used being a tint for the county outlines. Sometimes outline maps showing only the county or township boundaries and containing no lettering at all are the best for pin work.

MAP MOUNT.

The mounting of the map is an important feature which is often overlooked by those who have not had previous experience with maps, or do not know the possibilities. Wood is unsatisfactory unless it be very soft and made up several ply to prevent warping and cracking. Sometimes wall boards are used and these are more satisfactory than wood as they come in widths four feet wide, and can therefore be made in one piece. Unfortunately, however, all marking pins now on the market are so long that they project through such board and those handling it are liable to injury from deep scratches received from the projecting points. Incidently, the pins cannot be pushed way in up to the head in either of these forms of mounts, because of their hard and compact texture. There are two reasons why pins should be pushed way in. One is to avoid the displacement of pins in dusting. Another reason, particularly important if photographs are to be made of the map, is that map pins which are stuck in way up to the head will photograph in their true location without throwing shadows. When pins stand out from the map, those nearer the edge of the map are apt to show in the photograph as though inserted a block or so from where they belong.

A form of mount (Fig. 1) which obviates the disadvantages mentioned above is one consisting of cellular strawboard and pressed cork. The soft cellular board backing makes it easy to push the pin in and the cork offers just enough frictional resistance to hold it securely.

It may also be desirable to size and varnish the face of the map as this protects it against dampness, and from being soiled by the hands of those who manipulate the pins. If it is desired to write on the map in any way, however, the varnish cannot be used. There is, however, a gloss size which partially protects the map and still makes it possible to write on same.

It is often poor economy, particularly in dry offices where warping is likely, to fail to provide a map with a good substantial frame. Very small maps, however, can sometimes be left unframed with the edges bound with tape, like a passe-partout photograph.

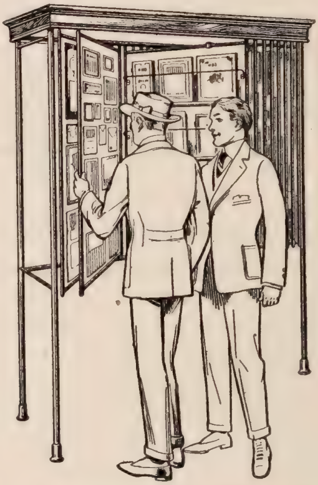

FIG. 2. Swinging Leaf Display Fixture.

In some very large places, sectional maps are employed, the maps being mounted in the drawers of a cabinet or on swinging leaves (Fig. 2) built like a large book. Generally speaking, however, it is found better for city maps to have the entire map in one piece. If a great many facts have to be shown, it is usually better to show each group of facts on a separate sheet rather than use a very large scale map in sections.

MAP MARKING DEVICES.

Public health officials were among the first to recognize the advantages of the pin map. In fact, the author recalls a case where a map was made up with common pins, colored heads being made of sealing wax. For a long time the only kind of marker for maps was a cloth head tack like a small carpet tack. The tack point defaced the map, often rusted the cloth and even if the cloth was not rusted, it was sure to fade after exposure to the light. Recently, however, a newer type of marker (Fig. 3) has been introduced. This is a needle pointed pin of steel with spherical head of glass. These pins come in two sizes, 3/16 and 3/32 of an inch in diameter, respectively. The smaller size is particularly useful on city maps where the scale is close. These pin heads are made of colored glass, and the color will never fade like the cloth tack, nor will it scratch off as in the case with pins on which the color is painted.

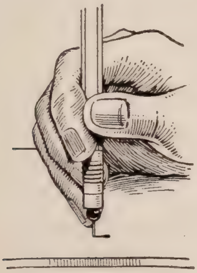

Fig. 3. Where many pins have to be inserted it is easier for the fingers and for the pins to use a pencil eraser as a pusher in the manner shown.

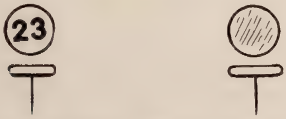

Fig. 4. Numbered Glass Pins. Rough Surface Glass Pins.

As sixteen distinct colors are available; it is possible to indicate by the pins alone an enormous number of facts. Moreover, still other types are available as, for instance, the spherical head with a dot, dash or X on top of it, also rough surface flat head pins (Fig. 4) on which numbers can be written or pins of celluloid or glass on which the numbers are already printed.

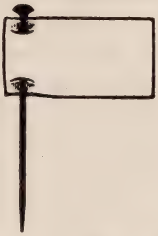

Fig. 5. Signal Flag.

Large pins of celluloid are available, $\frac{3}{8}$, $\frac{5}{8}$ and $\frac{7}{8}$ inches in size. Those with rough surface will take India ink or pencil markings easily, and these markings can be erased if the proper care is used. There are also signal flags (Fig. 5) of colored celluloid and pins with small card labels.

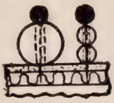

Fig. 6. Pin and Beads.

In addition to these devices for indicating one fact, there are available beads (Fig. 6) and map rings which can be used in connection with the ordinary pins and show several facts at any one point.

USE OF BEADS AND MAP RINGS.

A bead can be used in connection with a pin to show two facts at one point. For instance, the color of the bead may denote the nationality and the color of the pin the disease. Two beads may be used on the one pin to show three facts on one point. Too complicated systems, however, should be avoided. Beads can, however, be used readily to indicate quarantine, quarantine removed, fatal cases and hospital cases. If only one bead is to be used beneath the pin, the small pin and the large bead (Fig 6) make the best combination. When looking on the map, the color of the pin appears to be surrounded by the color of the bead somewhat like a target. Map rings can be used instead of beads in this same way. Another use of beads is where it is desired to indicate an accumulation of cases on one spot. These bead columns are particularly valuable to show cases in a hospital or tenement. This avoids spreading pins over an area surrounding these nests of diseases. Long pins are available for this purpose, but if not long enough, steel wire can be used.

Where the beads pile up very high, it is convenient to make every fifth or tenth bead another color. This makes it easy to read the number of beads. A bead map of a congested district will show the hills and valleys of an epidemic in a very striking manner.

Map Cord.

Map cord is used in connection with pins, to show the sequence of the spread of a disease or the course of a suspected milk route. This cord can be obtained in the same colors as the pins and in practice may be held in place by being looped around small pins placed at the angles in the route.

SELECTION OF COLORS.

While every health executive must to a certain extent plan his own color scheme of pins and other marking devices, a careful choice of the colors to represent these facts should be made before even a simple series of maps is planned. Care should be taken for instance, not to have the color of a children's disease conflict with that of an adult disease. This is particularly true if beads or map rings are used as will be explained below. The following table gives a list of some of the facts that are commonly shown, and a carefully selected color scheme applicable to the entire lot:

COLOR SCHEME TABLES.

Pin Maps for Health Departments.

Diseases.

1. Diphtheria and Croup	Green
2. Malaria	Navy Blue
3. Measles	Heliotrope
4. Whooping Cough	Slate
5. Poliomyelitis	Canary Yellow
6. Scarlet Fever	Red
7. Small Pox	Brown
8. Typhoid Fever	Orange
9. Tuberculosis	Black
10. Meningitis	Lavender

Signals.

Beads or Map Rings.

Quarantine	Orange Bead
No Quarantine	No Bead
Death	Black Bead
Hospital Case	White Bead

Ages.

Under 1 year	Black
1 year	Turquoise
2 years	Blue
3 “	Brown
4 “	Red
5 to 9 years	Orange
10 “ 19 “	Pink
20 “ 29 “	Canary Yellow
30 “ 39 “	Heliotrope
40 “ 49 “	Green
50 “ 59 “	Lavender
60 “ 69 “	Light Green
70 “ 79 “	Navy Blue
80 “ 89 “	Slate
90 “ 99 “	Yellow
100 and over	White

Nationalities.

1. American	Red
2. Chinese	Yellow
3. English	Blue
4. French	Lavender
5. German	Black
6. Greek	White
7. Irish	Green

8. Italian	Light Green
9. Japanese	Brown
10. Mexican	Heliotrope
11. Polish	Slate
12. Portugese	Turquoise
13. Spanish	Pink
14. Swedish	Navy Blue

Other nationalities not mentioned in the above list are Armenian, Syrian, Turk and French Canadian. These can be substituted for any of the above nationalities not prevalent in the district studied. Sometimes a certain color is used for "all other nationalities."

USES OF MAP PINS IN HEALTH DEPARTMENTS.

Facts which a Health Department usually desires to indicate on maps are those dealing directly with the communicable and reportable diseases. Maps are generally prepared to show the location in the city or town of each case of tuberculosis, scarlet fever, measles, etc. They are, however, by no means confined to this use alone as they are often used to indicate sources from which milk or other food supplies are obtained and the routes over which they travel, location of vaults, stables and sources of pollution for water supplies; also by the food and inspection departments not only for the location of restaurants and markets, but also for indicating the activities of inspectors. Such maps are not only valuable to the health officer and his subordinates in helping him intelligently to deal with conditions, but also offer a striking and incontestable proof of certain facts which it is desirable to show to some committee or official, in order to effect any given reform. Maps of this kind not only show that the health officer is handling the matter in an intelligent and modern way, but those who view them know that the maps themselves are not influenced by over-enthusiasm or human frailty,—they only show the cold facts.

In some cities epidemics among school children are indicated not only by day school but also by Sunday school classes. It is frequently found that diseases are spread from one school to another by children who attend different schools, but are in the same Sunday school class. The pins usually show this up very effectively.

One of the eastern state departments of health is planning to use a swinging leaf fixture (Fig. 2) to hold maps of the counties in the state. On these large scale maps, every conceivable sort of health data is to be plotted. This is in addition to the maps of the communicable disease section which brings its own maps up to date each day. On these large maps the location of epidemics is shown, but they are only of secondary importance and are only corrected weekly. The number of cases of any one disease is shown by a numbered pin in the city affected. The other data is shown in the following way.

1. *Health Officers* are indicated by large celluloid tacks $\frac{3}{8}''$ in diameter, with the name of the health officer written on the tack in pencil, also a small symbol in a secret code, indicating specific information as to the ability of the man.

2. *Sanitary Supervisors* are indicated by the same form of tack but $\frac{5}{8}''$ in size and blue in color.

3. *Epidemiologists, Supervising Nurses, Public Health Nurses, Inspectors, Tuberculosis County Hospitals and Dispensaries, Infant Welfare Stations, Private Health Agencies,* etc., are indicated by spiral top pins with cards, the color of the card indicating the nature of the agency, the name on the card being that of the agency.

4. *Epidemics* are indicated as above stated by numbered glass head map pins, the color of the pin indicating the disease and the figures on the pin indicating the number of cases. The color scheme indicated on page 678 is used for this purpose, but the color pink is added for emergencies.

5. *Water Supplies* are indicated by spherical headed pins 3/16″ in diameter. A good

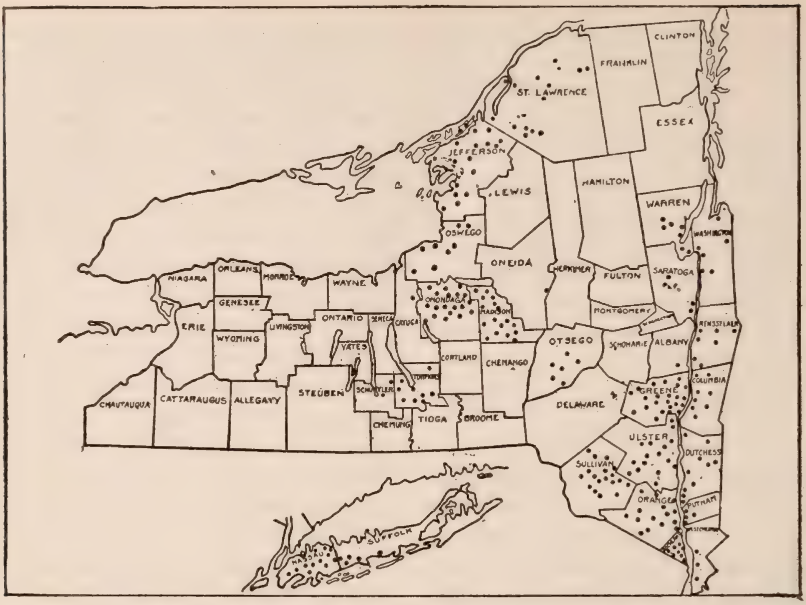

FIG. 7. A Pin Map of New York State. Each pin on this map shows one of the Districts in which New York State Supervising Nurses assisted local Health Officers in Poliomyelitis work during the 1916 epidemic. Note the advantage of a very plain outline map. This was copied from an illustration in the New York State Department of Health, "Health News," for November, 1916.

supply is indicated by a white pin with red spots, a bad supply by a black pin with white spots and questionable supplies by a turquoise pin with a white spot.

6. *Sewerage Systems* are indicated by a navy blue pin.

This plan is to be extended so as to show dairy conditions, labor camps, laboratory facilities, pasteurizing plants, etc.

This system has been worked out by Dr. B. R. Rickards, Assistant to the Deputy Commissioner, New York State Department of Health. It is hoped, by this Department, that the plan will be duplicated by each of the sanitary supervisors for their own district.

EXAMPLES FROM ACTUAL PRACTICE.

Maps are used in various ways by different cities, and as mentioned before, each man usually has to work out the best scheme for his own condition. Some examples from actual practice however, may bring out the advantages of various methods.

Washington, D. C.

In Washington, D. C., pins are used to indicate contagious diseases. The pin is stuck through the end of a small piece of paper, one-eighth of an inch wide and about one inch long. On this paper is written the case number assigned that case. When the case is removed from quarantine, the case number is removed but the pin remains in the map as a record. Maps are kept for two or three years back always in sight.

Providence, R. I.

In Providence, R. I., the maps are not glued on the mount, but are mounted on cloth and stretched over the cork composition mount in a substantial oak frame. Each map is kept for a period of six months, then the pins are removed. As each pin is removed, colored ink of the color corresponding to that of the pin is used to mark the spot on the map where the pin was located. The maps are then filed for future reference. Separate maps are kept for special epidemics, such as poliomyelitis, but other contagious disease studies are all kept on one map. A pin with a white spot on top of it is used to indicate a hospital case and a black pin a death. A scale is drawn on the right-hand edge of the map indicating the total probable number of cases at any one time and a pin is stuck into this scale each day, being moved up and down as a barometer of the number of actual cases at that time. Infant Mortality maps are also kept utilizing pins and beads to show facts as suggested under the heading "Use of Beads and Map Rings."

North Carolina State Board of Health.

The North Carolina State Board of Health has recently adopted a system of pin maps involving some new features.* This has been worked out by Dr. A. R. McR. Crouch, State Epidemiologist, assisted by Mr. Warren H. Booker, Chief of the Bureau of Engineering and Education, and Dr. B. E. Washburn, Chief of the Bureau of County Health Work. Eight maps of the state are mounted on swinging leaf fixtures. One of these maps is used for each of the common reportable diseases. The maps are drawn on white paper and show only county and township lines, county seats, principal towns, railroads and water courses. Numbered tacks are used very extensively so as to show duration of quarantine.

When a disease is reported it is indicated on the map for that disease in the township or city in which the disease occurs, by a colored tack which has a numeral representing the day the quarantine will expire. In order to avoid complexity in the system no record of a quarantine is kept for more than thirty days; except typhoid fever, which is really not quarantined but merely placarded, for forty-two days.

The monthly reports are recorded on the maps, by counties, townships and towns. The maps also show the number of existing cases.

The following will explain the use of the various tacks:

1. White tacks with black numerals represent cases, the quarantine of which ends in the month of the report. At the end of quarantine they are replaced by red tacks (tacks No. 4).
2. Black tacks with white numerals represent cases, the quarantine of which ends in the month following the report. These tacks will be replaced by No. 3 at the beginning of the month following the report.
3. Yellow tacks with black numerals represent cases, the quarantine of which ends in the month following the report but which were tabulated during the previous month. Tacks No. 2 are replaced by these.
4. Red tacks represent cases, the quarantine of which ended in the month during which they were reported. These tacks are used only to replace tacks No. 1.

THE METHOD APPLIED TO A CASE OF MEASLES.

A case of measles is reported on September 6, 1917, from Beaverdam Township, Richmond County. The quarantine period of measles is twelve days. The quarantine, then, would end on the 18th day of September (the same month of the report). Insert in the map for measles a white tack (tack No. 1) with a black numeral 18 on it. On the 18th, at the end of the quarantine, remove the white tack with the black numeral and insert a red tack (No. 4), which shows that the quarantine of the case ended the same month of the report.

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* This description was kindly furnished the author by Dr. Crouch.

Another case of the same disease is reported from the same place on the 28th of September. In this instance the quarantine period of twelve days extends to October 10th. Hence, a black tack with white numerals (tack No. 2) is used to represent this case.

On October 1st, before any tacks are removed or inserted, the red and the black tacks (Nos. 3 and 4) are counted and when added together give the total number of cases reported in September. The month of September with its total number of cases is then represented on the map by a fraction written with red ink in small letters. The numerator of this fraction (9) represents the month and the denominator (2) represents the total number of cases (9/2).

Now, the red tack is removed and the black tack with white numeral (tack No. 2) is replaced by a yellow tack (tack No. 3) bearing the same numeral which shows that the quarantine ends in the (what is now) present month (October), but is counted in the past month's report. On the day of the month (10th day of October) corresponding to the numeral on the yellow tack (tack No. 3), the tack is removed and no further record is kept of it, because the quarantine has ended and the case was recorded in the previous month. This method is applicable to all diseases, the quarantine period of which is not over thirty days, providing two days are added to the quarantine period in month of February.

In typhoid fever, each case is considered as existing for forty-two days. In many cases this period covers portions of three months and requires a different system of recording. The following will explain the use of the various tacks in recording this disease:

1. Black tacks with white numerals represent cases, the placarding of which ends during the month following the report. These tacks will be replaced by tacks No. 2 at the beginning of the month following the report.
2. White tacks with black numerals represent cases, the placarding of which ends in the month following the report. When the period of placarding expires the tack is removed.
3. Black tacks with red numerals represent cases, the placarding of which ends during the second month after the report. These tacks are replaced by tacks No. 4 at the beginning of the month following the report.
4. Yellow tacks with black numerals represent cases, the placarding of which ends during the second month following the report. These tacks replace tacks No. 3 and will be replaced by tacks No. 2 at the beginning of the second month following the report.

THE METHOD APPLIED TO A CASE OF TYPHOID FEVER.

A case of typhoid fever reported September 6th, is represented on the map by a black tack with a white numeral (tack No. 1) in the township or town in which it occurs. The numeral on tack No. 1 (18 in this case) represents the day of the following month on which the placarding ends; which is October 18th.

This tack remains in the map until the first of the month following the report, which shows that the period of placarding does not end in the month of the report.

Another case is reported on September 28th. The period of placarding for this case will end November 9th. In this case a month intervenes between the date of the report and the date the period of placarding ends. This case is represented by a black tack with a red numeral (tack No. 3) which remains in the map until the first of the month following the report; and when all of these and the No. 2 tacks are counted and added the total is the number of cases for September. The month (September) and the number of cases are recorded on the map the first of the month following the report (October in this case) as the fraction:

$$9/2 \begin{Bmatrix} 9 = \text{month} \\ 2 = \text{cases} \end{Bmatrix}$$

After the month and cases are recorded, the black tack with a white numeral (tack No. 1) is replaced by a white tack with a black numeral (tack No. 2). The numeral on tack No. 2 corresponds to the day (October 18th) that the period of placarding ends at which time the tack is removed. The black tack with a red numeral (tack No. 3) is replaced by a yellow tack with a black numeral (tack No. 4). The numeral on tack No. 4 corresponds to the day of the second month after the report on which the period of placarding expires. This tack remains in the map until November 1st, when it is replaced by a white tack with a black numeral (tack No. 2), the numeral of which corresponds to the day (November 9th) that the period of placarding expires, at which time the tack is removed.

CHARTS USED BY HEALTH OFFICERS.

Data which has to be recorded chronologically is best shown in graphic form. Reports issued by health officers have in the past been filled with table after table of death-rates and similar figures. Tables are really necessary as a matter of record and accuracy, but even health officers will probably admit they hardly make interesting reading. A table of figures is apt to be very confusing. It is hard to pick out the trend of facts from a mass of figures which confuse the mind. In a graph or chart however, this same data can be shown in pictorial form. In such a picture one sees not only figures for each year, but the relation of any one year to all the others, both in time and magnitude, all easily comprehended at a glance.

Health officers have become so accustomed to looking at tables that they have been rather slow to realize the advantages to themselves and to the public who read these tables of presenting this matter in the form of graphic charts. Many have, however, already realized the value of keeping such records so that they may be of daily use and this practice is rapidly growing.

Errors to Avoid.

While the use of charts is commendable, some curious errors occur when the novice starts in to prepare these without previous study of the subject. Even in important publications and exhibits today, the erroneous comparison of the figure of a man illustrating the death-rate in two different years is seen. The makers of these graphs fail to realize that when a man is drawn twice as high, he is also drawn twice as wide. This makes the area occupied on paper by the large figure four times the size of the small one and gives an erroneous impression, particularly to people who do not know much about charts. Of course, such methods are sometimes purposely used for exaggerating facts, but the practice is of rather dubious value, as it tends to throw discredit on the entire method. The same objection applies to the use of circles, the areas of which vary as the square of their diameter and, likewise, to the use of cubes and squares.

Another bad practice frequently seen is the cutting off of a curve diagram at a point above the zero line. This may give rise to very misleading impressions. If the zero must be cut off in order to use a larger vertical scale or to save the expense of a larger engraving, the base line of the chart should be jagged in order to attract attention to the excision.

The circular chart which is popular with some health officers is, in the writer's opinion, a great misfortune. Sectorial divisions are not easily compared, as these are area-comparisons of an odd shape. For making comparisons, the bar chart is far preferable as the lengths are directly proportional to the figures and even in these the use of figures inside of the bar is apt to distort them so as to give an entirely wrong impression.

STANDARD PRACTICES.

Certain standards in plotting graphs should be adopted as rapidly as possible. A special joint committee of the leading engineering societies has prepared a report, "Standards for Graphic Presentation," outlining the best practices and illustrating how these should be carried out.*

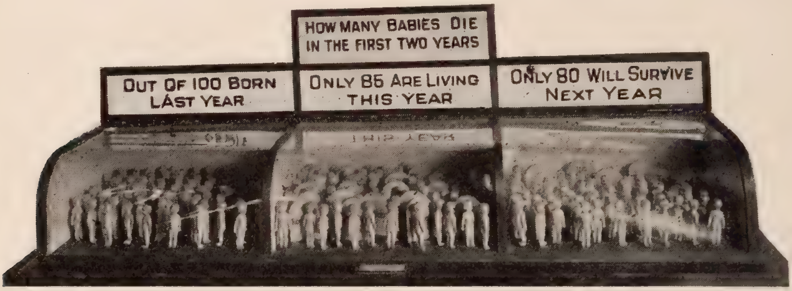
HOW MANY BABIES DIE IN THE FIRST TWO YEARS
OUT OF 100 BORN LAST YEAR
ONLY 85 ARE LIVING THIS YEAR
ONLY 80 WILL SURVIVE NEXT YEAR

FIG. 8. Exhibit Model showing statistics in a graphic manner.

SPECIALLY ENGRAVED FORMS.

Until recently, health officers and others had to be content with the usual decimally divided millimeter papers. Since facts pertaining to health nearly always have to be plotted with reference to time, a special series of papers of convenient size has been devised. These are conveniently ruled into spaces divided into hours, days, weeks, months and years. Such charts are being more and more extensively used by health officials; though, unfortunately, many still do not appreciate their full value. Daily, weekly, monthly and yearly charts can be kept of total number of cases, cases in quarantine and deaths by diseases, nationalities and ages and the curves show at a glance many more facts than could be incorporated in a lengthy and wordy report and several tables of figures.

Good examples of the use of such charts in pictorially illustrated reports, will be found in the bulletin of the New York State Department of Health (Fig. 9), and also in some of the bulletins of the New London, Conn., Health Department.

Beside the charts divided conveniently for use in plotting data with time as a basis, a bargraph chart is available. This consists of a number of bars outlined in green ink. On the lower edge of each bar is a scale dividing it into 100 parts. This makes it easy to plot percentage charts or comparative bars showing the mortality or morbidity of various groups or classes.

"RATIO" PAPER.

Another especially interesting form of paper is ruled regularly for time, but with rulings spaced logarithmically in the other direction. When comparing very small quantities with larger ones, as for instance the deaths from a disease with the population over a long period of years, or even months, this paper is invaluable. Curves plotted on paper ruled ordinarily are apt to be misleading. This will be readily seen if a definite example is cited. For instance,

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*Preliminary Report Joint Committee on Standards for Graphic Presentation. American Society of Mechanical Engineers.

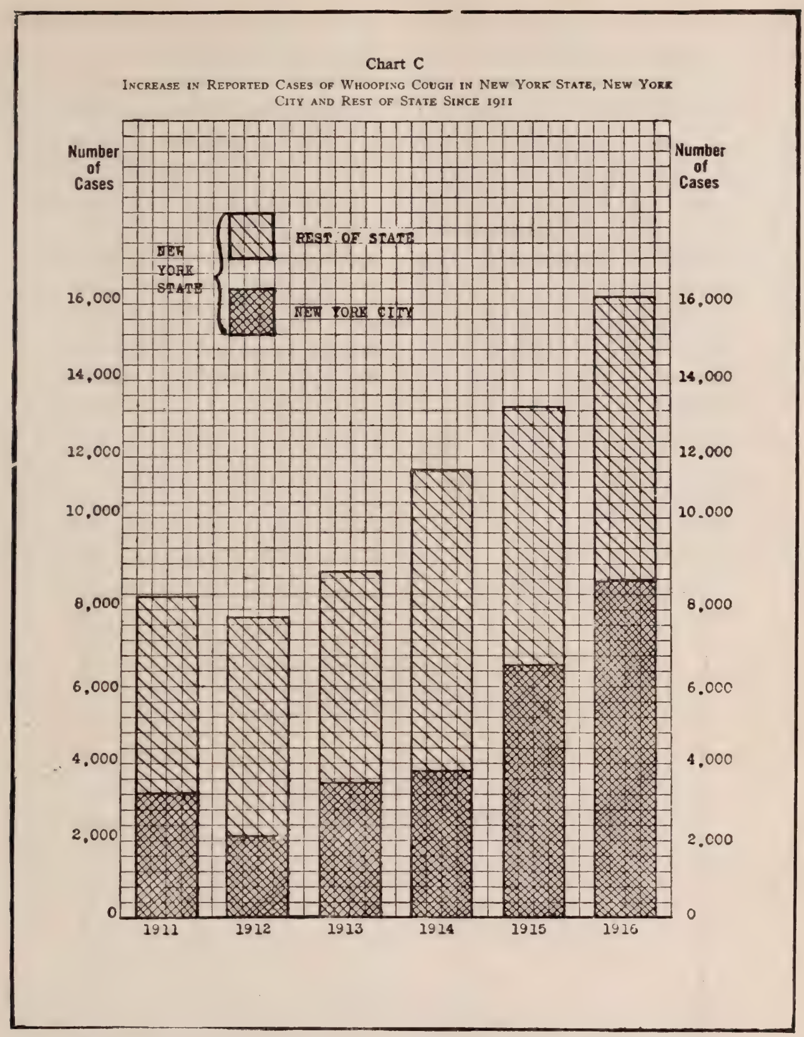

Fig. 9. The use of ruled paper to save time in drawing bar charts of various lengths. If the ruling had been in blue ink and the lines were drawn in black, when the zinc cut was made, the blue lines would have disappeared, leaving the bars to stand out more clearly. This is reproduced from the back cover page of the New York State Department of Health's, "Health News" for March, 1917. The bars fit typewriter spacing.

suppose the number of deaths from tuberculosis during the last year to have been 100 and this year to have been 125. The population of the city, let us suppose, is 100,000 and has increased during the year 10 per cent. The rise in the curve of population during this period will be 10,000 spaces, and the rise in the curve of deaths would be twenty-five spaces. It will thus seem that while the number of deaths has increased it has not increased nearly so fast as the population. The slope of the population curve would be far steeper than that of the death curve. As a matter of fact, of course, this is not the case. The number of deaths has increased more than the population has in proportion. This would be shown at a glance if this logarithmic paper was utilized. Here the size of the item to be compared is thrown out and only the percentage increase or decrease is taken into account. Thus any two curves having the same slope are always sure to be increasing at the same rate. This is the only safe paper to use if it is desired to compare the rates of change of very small items, with larger ones on the same sheet.

Appropriation Chart.

Many health executives in common with those in business lines are puzzled to know just how they stand, when working with a fixed appropriation but variable expenses, and how to make purchases wisely and still keep within their appropriation. Failure to provide for this has often resulted in the return of an unexpended balance to the treasury, or in an over-expenditure of the appropriation. There is shown herewith a chart (Fig. 10) which is very simply made and by which it is easy to tell at any time, with conditions remaining as they then are, how much money remains which can be devoted directly to purchases.

Suppose, in the chart shown, the appropriation was $17,000. Suppose also that there are running expenses for salary and office costs amounting to $8,000 per year. A line is then drawn from the point marked 0 on January 1st to the $8,000 point on

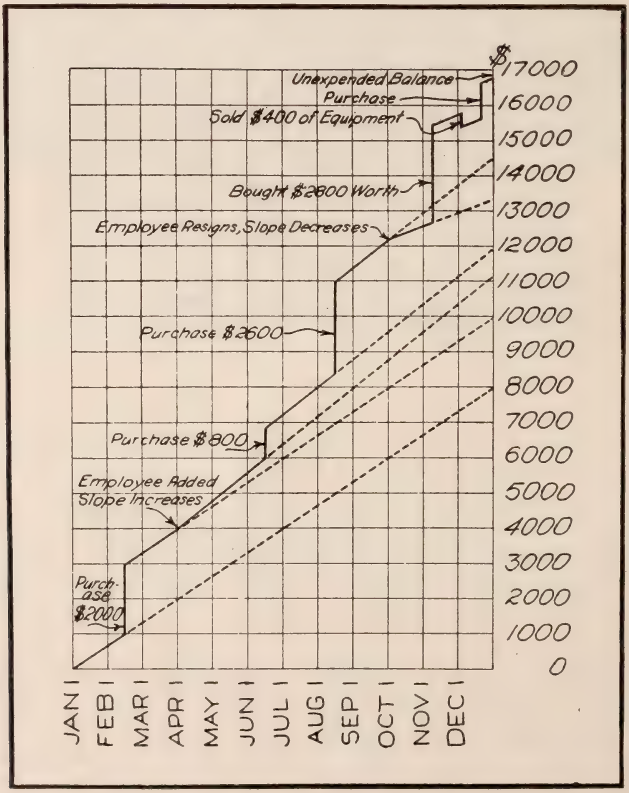

Fig. 10. Appropriation Chart.

December 31st. Suppose, for example, in the middle of February, a $2,000 purchase is made. In this case, the line is drawn vertically $2,000 high at February 15th and from the top of this another sloping line is drawn parallel to the first. This indicates that there has been used of the appropriation $10,000, and if office expenses and salaries remain the same, there will be but $7,000 available at the end of the year.

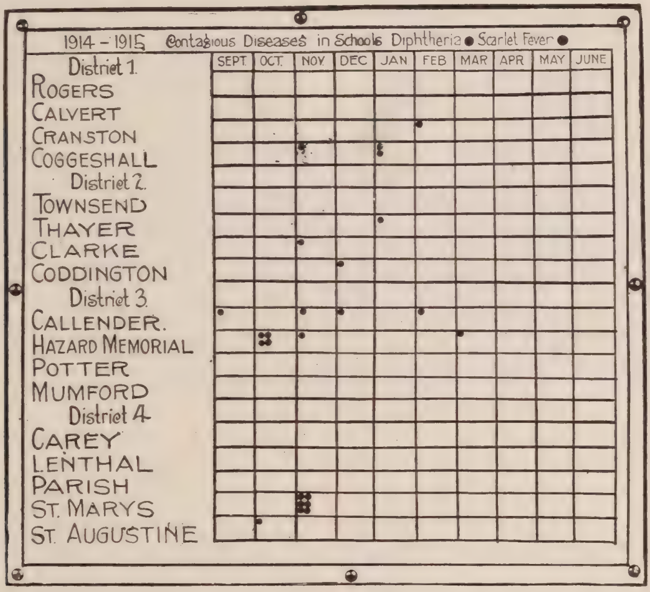

Fig. 11. Chart showing contagious diseases in schools used in Newport, R. I.

It so happens however, that on April 1st, a new employee is added. This employee received $133 per month or approximately, $1,200 for the remaining nine months. A point on the December 31st line $1,200 above the $10,000 line is located and a new line is drawn with a steeper slope, starting at April 1st and involving all the office expenses and salaries including the new employee's salary. About June 15th, $800 more of material is purchased and another parallel line is drawn, indicating that approximately $12,000 has been spent and only $5,000 still remains to be utilized. Another purchase of $2,600 is made about August 15th, but on October 1st, an employee who receives $40 per month resigns so that the slope of the running expense line decreases. Further debts amounting to $2,800 are contracted during early November. During the first week of December, $400 worth of old equipment is sold, which is deducted. This scheme can be carried out indefinitely so as to show the actual condition of any appropriation at any given time.

The use of a simple diagram like this, involving only a minute's time whenever important purchases or changes in personnel are made, will save considerable embarrassment and will tell more at a glance than a set of books would.

The writer is indebted for this suggestion to Mr. F. J. Schlink, Associate Physicist of the United States Bureau of Standards, who first mentioned it in an article in Industrial Management for March, 1918.

Mechanical Methods of Making Charts.

Health officers have unfortunately little time for drawing charts, except in the larger cities where an adequate clerical or drafting force is available. There are however, some mechanical ways of preparing charts which require no special skill and take but little time.

Charts are sometimes kept with pins instead of being drawn carefully in India ink or less carefully in pencil. In this case, the chart is mounted on the same type of mount as that recommended for maps. Map cord is used and also pins, the pins being stuck in as each point is located. This is a very useful expedient on charts which have to be kept up daily and particularly on large charts.

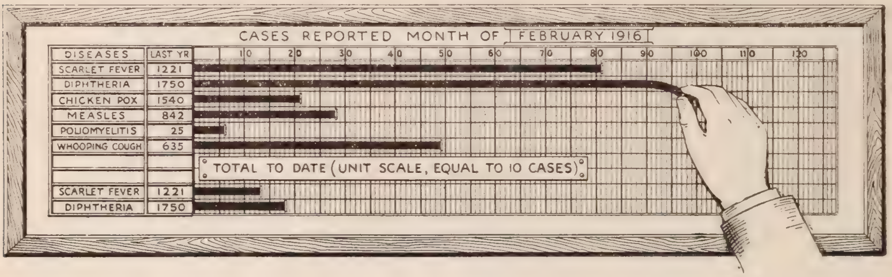

Fig. 12. Mechanical Bar Chart. This is about three feet long and hangs on the wall.

In Newport, R. I., the health officer keeps a chart (Fig. 11) of the number of children out with a contagious disease from each school. The chart is ruled with spaces for the names of the schools and the days of the month. Pins are stuck into the spaces thus formed, the number of pins indicating the number of cases in that school on that date and the color of the pin indicating the disease.

Still other devices have been prepared which are even more mechanical. By utilizing these devices a health officer can, in a minute or two every morning, summarize graphically the day's reports. For instance, there is a mechanical bar chart (Fig. 12). This consists of a board of the map mount composition with a number of spring rollers at the left. These spring rollers are concealed behind a name plate, in which is inserted the names of the various diseases or other items which are being charted. Through a slit in the board, tapes of celluloid, which are attached to the spring rollers, can be pulled out to any length. At the end of each tape is a needle point which can be inserted at the proper place, so that the tape makes a bar of appropriate length.

Composite bar charts containing graduated tapes of three or four respective colors are also available. These, too are provided with needle points and work after the manner of small shade-curtains. With this, it is possible to prepare, at a minute's notice, large size wall charts similar to the bar-graph style described previously.

Quarantine Meter.

An interesting device for predicting the date of quarantine expiration, or for follow-up work of every type has recently been prepared. It could appropriately be called a quarantine meter (Fig. 13). This consists of a box about fourteen inches square with a glass front and scale. Through an opening in this scale can be seen an endless tape, on which is printed a calendar showing every day in the year. The endless tape can be moved by a small knob. On the scale are arrows pointing to the endless tape, so as to indicate periods of one, two, three, etc., weeks up to eleven weeks and ten, thirty and sixty days respectively. By setting today's date at an arrow at the left hand, it is possible to predict in advance, the exact date which comes at the end of any period. This device was suggested to the writer by an entirely different form of quarantine meter used by Dr. A. J. Chesley, Director, Division of Preventable Disease of the Minnesota State Board of Health, in his own work. It should be of considerable use to health officers who have daily to compute the duration of incubation and quarantine.

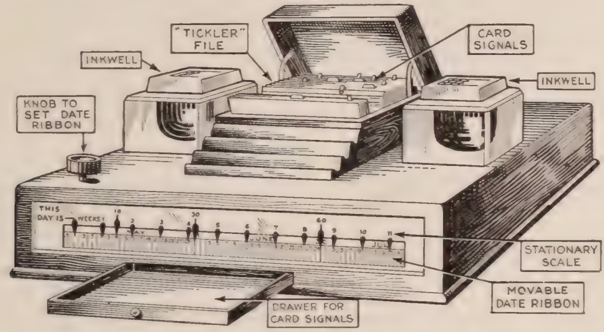

FIG. 13. Quarantine Meter. This is about fourteen inches square and designed to be set on the desk.

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The Open Air School.—It is not so long ago that the first open air school was introduced. In fact the first open air school was established in Charlottenburg, near Berlin, in 1905. The first open air school in this country was opened in Providence, in 1911. Today there are over 700 open air schools throughout the United States.

The purpose of the open air school is to build up the health of delicate children who are underfed, and anæmic and inclined to be tuberculous. At the same time, the plan is to educate the children in the normal way. For the open tuberculous case, a hospital is recommended. Children who are to benefit from the open air treatment should have at least two or three years of the cure. It is important that the children be adequately protected against cold by having proper clothing. For the best interests of the child, luncheons should be furnished in the school, and regular rest hours should be provided. The work in the school should be followed up by education in the home, through the medium of the school nurse. It is also important to have teachers who are particularly sympathetic and pleasant, yet who can maintain discipline readily.—Carrie B. Jackson, *Outdoor Life*, August, 1918. (*M. P. H.*)

⁂

Nearly 1,000,000 boys and girls throughout the nation have now been enrolled as Modern Health Crusaders, and recruiting to increase this membership to still greater numbers will soon begin by the National Tuberculosis Association, under whose direction this movement is conducted. The Crusade centers about a simple but fundamental program of health "chores," on the part of children, and enlists the rising generation of the nation's citizens in a better understanding of individual and public health essentials. (*D. G.*)

TRANSPORT SANITATION.

MAJOR CHARLES W. BERRY,
106th Infantry, Surgeon, U. S. S. President Lincoln.

THE problems in preventive medicine presented by a ship engaged in conveying troops are not new to the student of hygiene, and simply serve as an illustration of how easily and rapidly communicable disease may be disseminated whenever a large number of human beings are obliged to live in close and intimate contact for a given period of time.

Each and every inmate of the ship, as far as we know, may be the carrier of some pathogenic germ, which may find suitable conditions for its growth and development in the nearest person.

The steps taken to prevent the evil results, following the necessary crowding, and close personal contact among the men on a transport, must take into consideration the actual paths taken by the disease germs from one person to another, and then establish measures to put up a barrier on the different routes, or at least make the transmission a more difficult one.

A measure which naturally presents itself is the removal of any man who may harbor disease germs from the body of troops, so that the process may spread no further. This is done as a matter of course, when the disease can be recognized, but the difficulty lies in the fact that some of our more dangerous carriers give no outward signs that can be detected during a rigid physical examination, and the real condition can only be ascertained by bacteriological and other tests not available at the time. Another factor to be considered is the fact that most of our communicable diseases have distinct periods of invasion and incubation during which time the personal history of the man is the best guide to his future condition.

It is recommended then that the first step in conserving the health of troops aboard a transport should be a thorough physical examination of every officer and man, conducted by experts, before boarding ship, and that the medical officer accompanying the unit furnish a list of all who have been in contact with, or recently recovered from any illness.

All whose names appear on these lists, together with others detected during the examination are to be considered as a separate problem. No man, however slight his illness or indisposition, should start the voyage in the same quarters with the well troops.

This precaution to be of any value must consist of real work, and the time and effort expended will be well repaid when such is the case. The examination given at the start of the present voyage simply illustrated how little reliance can be placed on such tests when not properly conducted.

After troops are on board ship, a routine should be adopted that would insure that once a day every man would be looked over by a physician and questioned as to his condition, giving special attention to all food handlers. Slovenly methods and opportunity given to evade such examinations will be sufficient to give a false sense of security, and prove a menace to all.

Pathogenic bacteria gain access to the human body chiefly by inhalation, by the intestinal tract, and through mucous membranes and lesions in the skin.

Invasion by inhalation supposes disease germs to be floating in the air, perhaps free or attached to particles of dust. This only happens under unusual living conditions, where indiscriminate coughing or sneezing is going on, or where much dust is constantly being raised by the tramping of feet or improper methods of cleaning in closed spaces.

Invasion through the skin can take place in various ways, among which the most common are a wound, or through the medium of an insect. The measures that can be adopted to check such method of invasion are obvious.

Invasion through the intestinal tract or mucous membranes, which are the usual paths of infection, requires that the germ be first carried to the mouth or membrane in some manner, most often by the hands or through the food or other inanimate objects.

It is definitely known that most of the pathogenic bacteria which affect men can be found in the secretions of the body; namely, discharges from the nose and throat, saliva, urine and fæces. It has also been shown that there is a constant interchange from person to person through hands, foods and inanimate objects, of their secretions, and that such interchanges are immensely increased when a number of persons are crowded together for any length of time.

Another factor to be taken into consideration with the above is the length of time such bacteria can live in an unfavorable environment outside the body and also maintain their virulence, although in such crowded quarters as obtain on a transport they would probably be renewed often enough to be dangerous.

Measures needed to combat these souoces of infection do not receive as much attention as those directed toward a wound, bad smell, or cloud of dust, because the method of infection is not preceptible to us without special tests, and it is not uncommon to find the entire matter overlooked.

A little thought given to the subject will make clear how easily the hands, and from them food, or inanimate objects are contaminated by body secretions, and how in turn other hands carry them to mouths and susceptible mucous membranes. The spitting nuisance, defective personal hygiene, and general lack of cleanliness are factors to be considered with the above.

In the consideration of measures that may be taken to meet such conditions, it is irresistably brought home to us, that if we could keep all hands and everything that came in contact with them absolutely clean, nothing further would be needed, and this is true, the real question being in what way can this be accomplished:

Under service conditions surgical cleanliness could not be obtained, nor continued, nor is this necessary, as ordinary precautions obtainable by anyone will give very good results.

We will take up this question commencing with the quarters occupied by the men, which in transport ships are usually in the hold, poorly lighted and ventilated and hard to keep clean.

The tiers of berths in the compartments should be so arranged even at the sacrifice of some space, that there will be a clear passage about two and one-half feet wide extending around the four sides of the room. This does away with all corners for the collection of dirt and rubbish, and assists greatly in cleaning.

Framework of berths made of steel tubing are preferable and take up less room than those made of wood, are cleaner, and give greater fire protection.

All surfaces in compartments should be painted in light colors and electric bulbs placed so that when needed for cleaning or inspection, abundant light will flood every corner. The lightest compartment is always the cleanest one. Floor of sleeping compartment should be covered with some cement composition, that will not crack or become slippery when wet. A light color is preferable.

Electric fans should be placed at each corner of the compartment, so directed as to keep up a constant circulation of air around the room, eliminating all dead spaces and avoiding any direct draught on the berths.

This measure with the aid of ventilators and wind sails from the deck would provide adequate ventilation.

Compartments should be kept clean in the following manner:

Once daily roll up all of the lower berths and sweep the floor, so as to remove all rubbish which may clog up drains. Follow this by scrubbing well with soap and water and then dry thoroughly with well wrung out mops. One or two sweepings will keep the place clean until the following day. Containers should be provided for paper, rubbish, etc., that would otherwise be deposited on the floor.

Once a week all the framework and sides of the compartment should be cleaned in the same manner, and after each trip all canvas berths should be removed, scrubbed, dried in the sun, and replaced.

Bedding and clothing should be aired in sun as often as possible. Port holes should be kept open when permitted by service conditions to admit light and air. A small well-ventilated compartment at either end of ship, having a separate entrance, should be reserved for isolation purposes.

The addition of disinfectants to the water used for cleaning is not recommended. The bactericidal value of the solution is doubtful, and any odor in a close compartment is a disadvantage, giving a sense of false security. It is better hygiene to rely on perfect cleanliness, and not try to cover one odor with another.

Our daily cleaning should not end with the quarters occupied by the troops, but should extend to all parts of the ship, giving special attention to mess rooms and kitchens, where food is handled and prepared. On account of the congestion, the daily cleaning is a matter of carefully worked out routine, the men being moved from deck to quarters and back again, as the different parts are being cared for.

Some portions of the ship, as kitchens and mess rooms, require careful cleaning after each meal, other portions like the latrines require constant attention and these details should be carefully worked out by the one responsible for the sanitary condition of the vessel.

The latrines on board a transport are a constant source of danger, being used to their extreme capacity at almost all hours, the rate being about twelve men per minute. Those on board are of the trough pattern with intermittent siphon flushing. There is a constant tendency for the soil pipe draining these troughs to become obstructed, and cause the troughs to fill, and then have their contents spill over the floor of the apartment with each roll of the ship.

With such constant use a steady flush would be preferable, but this requires extra pumps to furnish the water required. The openings from the soil pipe to the trough should not present any obstructions to a steady flow, and the pipe should be of large enough diameter to readily carry off all the contents of the trough. There is also a tendency for the sides and top to become soiled with fæcal matter and a deeper trough, egg shape, with large end down, containing some water all the time yet flushed completely at each discharge of the siphon, and deep enough so that its contents would not slop over with the rolling of the ship, would answer the requirements better.

To maintain cleanliness in such an apartment under service conditions, requires a thorough scrubbing of floors, troughs, etc., once a day, using hot water and soap—a man should be kept constantly on duty after this to see that the drains do not become obstructed and the place is kept in order.

It is a wise precaution to place a sentinel at the entrance to prevent men from carrying anything into the apartment, thus preventing the throwing of newspapers, waste, etc., into the drains. Suitable toilet paper should be furnished in each latrine.

The serving of food presents a problem which must be worked out for each unit, the system now in use being to form lines of men each man carrying his mess kit. These lines pass before a table where the food is given out by men placed behind the large containers used for that purpose.

All food handlers are sources of danger and should constantly be under the observation of the medical officers.

An adequate supply of boiling water should be on hand after each meal for the cleansing of mess kits, and measures taken to see that every man uses and drinks from his own utensils only.

Personal hygiene should receive close attention, bearing in mind that in the best of sanitary surroundings disease may be easily conveyed by the hand to mouth route and that this path is probably the most common one under any circumstances.

Available shower baths should be so used that the entire command is bathed in turn as often as possible; and the advantage of personal cleanliness should be taught on every occasion. If a basin contrived in such manner as to always automatically contain a small amount of clean water, could be placed outside of each latrine, and each man leaving there be compelled to wash his hands, a great advance would be made. If the same thing were in reach of the mess line and each man had to wash his hands before he handled his food, the hand and mouth route would do a very poor business.

The chances of washing clothing on board a transport are very slight, and each man coming aboard should have had a bath and wear clean underwear, besides having one or two changes in his possession.

All the troops on board should be divided into units of convenient size, and suitable deck space assigned to each at different times during the day, so that each unit will have opportunity for physical drill and exercise at least twice during the twenty-four hours.

Drinking water and food supply are looked after by the transport service.

Briefly summarized, then, the hygienic requirements aboard a crowded transport are:

1. A rigid physical examination and careful scrutiny of the personal history of each man before going on board ship.
2. Isolate all sick, carriers or suspects.
3. Daily inspection to detect other cases, followed by prompt insolation.
4. Sanitary surroundings.
5. Personal hygiene.
6. Blocking all routes of infection.
7. Sufficient exercise.

HOW TO WRITE NEWSPAPER COPY.

Prof. Charles E. Bellatty,
School of Business Administration, Boston University.

HEALTH officers, social workers and others who appreciate the value of newspaper publicity in furthering good causes should do their part to make "copy" agreeable to the eye of the editor as well as interesting to his readers. Many a good cause loses headway when a busy editor throws a carelessly prepared manuscript into the waste basket. The following suggestions for making clean copy are offered by an experienced publicity man and are well-worth remembering.

Whenever possible submit typewritten manuscript.

Double-space or triple-space between the lines.

Leave three inches or more blank at the top for a headline.

Leave a half-inch blank space at the bottom of each page for convenience in pasting.

Do not carry a sentence from the bottom of one page of manuscript to the top of the next page.

Avoid breaking words at the end of lines.

Number each page in the center at the top and draw a half circle under the number.

When you write in long-hand print out all proper names.

Be sure to spell all proper names correctly and to supply the initials necessary to identification.

Use paper of standard typewriter size or smaller.

Sign your name.

If you write headlines put action into them.

When you have time rewrite your copy: Cut out unnecessary words and make your opening paragraph as interesting as you know how to make it.

Write only on one side of the sheet.

After the story appears thank the newspaper for printing it and try to avoid criticism if typographical errors or editorial mistakes are apparent.

Remember that the newspaper wants items when they are newsy.

THE CHILD'S TEN COMMANDMENTS TO PARENTS.

AND a new voice said to the people, I am the generation yet unborn who by being well born and properly cared for shall lead the race out of the bondage of disease to a healthier, better and happier life.

Thou shalt have no temporal gods before me.

Thou shalt not bow down thyself before false images of temporal pleasures or become bound by overwork or by intemperance in thy food, thy drink or thy habits, for thy God is a righteous God and visiteth these sins in the form of physical weakness upon us thy children.

Thou shalt not take my name in vain or think lightly of me in thy younger days for thou must begin when a boy or girl to prepare for my coming, by building a strong body and keeping it free from harmful substances and the taint of disease.

Remember the pre-natal days and keep them properly. Other days shalt thou do hard labor if need be, but these are the months that are mine, and thou shalt seek advice of thy physician and so conduct thy life and that of thy family that I may become strong and not afflicted in these days of my coming.

Honor thy sons and thy daughters that our days may be long upon the earth; when we are babes give us the food which nature intended us to have and see that such hygienic measures prevail in thy house and in the community where thou livest that we shall not be menaced by disease.

Thou shalt not kill our confidence in thee by telling us lies about ourselves, and when at an early age we begin to ask from whence we came, thou shalt answer the questions truthfully and volunteer no further information.

Thou shalt not make it easy for us to commit sexual excesses by neglecting to tell us at the time of puberty what changes are to come upon our physical beings, and at the time of early manhood or womanhood thou or thy trusted friend shall explain to us individually the nature of those diseases which may inflict suffering upon us and upon those we love, explaining also the rules of personal hygiene, which will enable us to avoid all excesses that would make us in our generation unfit for parenthood.

Thou shalt not steal our peace of mind by failing to inform thyself and consult with us frankly upon the problems involving the proper development of the body, the mind or the social and religious conscience.

Thou shalt not bear false witness to what thou wouldst have us believe by leading a life which is unhygienic, empty of serious thought or immoral.

Thou shalt not covet ease for thyself or thy children thereby forgetting the duties of every person as a citizen and a neighbor.

C. E. Turner, C. P. H.

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SCIENCE AND EFFICIENCY.

The old philosophers especially busied themselves with the science of knowledge and the alchemists and sometimes the holy monks held communication with his Satanic Majesty by delving into the mysteries of chemistry and astrology. Similarly the savants of the eighteenth century and the early experimenters of the nineteenth worked silently like the earliest searchers after truth, rather than as co-workers in the great industries then coming into existence. Professor Brewster, president of the British Association in 1858, lamented the fact that no university in England had any science curriculum, while Pasteur in the sixties in his little laboratory in L'École Normale, in Paris, was ever bemoaning the limited grants devoted to science in France, while Liebig and other German chemists had special provision made for investigation work in the large German universities. The history of the American Public Health Association, outlined in the May number of the Journal, tells an equally eloquent story of the varied fortunes of public health during half a century. Equal to the regrets of Pasteur were the complaints of Sir Oliver Lodge, before an educational conference held in the winter of 1916, with regard to the neglect of the great manufactories, and even of the Army Department in England, to make use of the teachers of technical science through utilizing their knowledge both in industry and war. To-day, when the war has become one of machinery and applied science in medicine, it would seem as if nothing were needed to insure the direct application of the methods of science to every phase of human activity, whether private or official. To illustrate by a single example it is usually estimated that 10 per cent of all the typhoid patients die, that 10 per cent of all rural deaths are due to typhoid, and that the greatest number of these occur in persons between fifteen and thirty years. The statistics of the thirty-five registration cities of the United States, with a population of 20,000,000, show that the deaths from typhoid had fallen

6.7 per 100,000 in 1917 as compared with the average of 19.7 for 1907–1911. The biologist and sanitary engineer have thus, within ten years, saved directly 2,600 lives in a single year and 1,560,000 days of sickness and economic loss; yet even where such technical knowledge is being recognized and utilized, it is only necessary to compare for instance, legal fees and the salaries of managers of large industries, with the salaries of chemists, biologists, and engineers in the same institutions, to comprehend that the science which makes efficiency possible is paid for, often less well than is the head mechanic.

Now, it may be objected that the pursuit of science must not be confused with the nerve-racking activities of a business manager in a competitive industry, and that wisdom and the pursuit of knowledge belong only to the Academe where Athene presides; but mediæval scholasticism can no longer supply the needs of modern civilization and the application of science to every branch of human activity amongst any progressive people must be recognized as one of its chief privileges and duties.

What has hitherto been the status of most of the 20,000 municipal medical officers in the United States, or indeed of most state health officials? Appointed through some political accident or reaction, the garnered experience of this whole body of educated public officials is in practice "scrapped" after each election, while the public, the medical profession and the science of public health are all enormously injured. That so much has been done and not so little under the conditions in the past has been the marvel. Not a little of the harm done has been due to the attitude of the scientific teachers in our colleges. They have, partly through lack of experience in public affairs and partly through a scholastic priggishness, stood aloof as teachers only, instead of lending their specialized abilities to diffusing science in its practical application, whether in the industries or in public health. The war has brought all together in their natural relations and it is to be hoped that from now onward it will appear to the scientist as much a public and patriotic duty to have his abilities and services devoted to increasing the vital and social efficiency of the people at home as he is now doing so freely in their application to the work of winning the war. (*P. H. B.*)

INFANT HYGIENE IN WAR-TIME.

Recent studies made by Guilfoy* and Eastman† accentuate the importance of the infant mortality-rate from congenital diseases. During the time when infant mortality-rates have shown such marked reduction in progressive communities, it has been quite evident to those in charge of the work that the reduction has taken place almost wholly in those groups of disease known as diarrhœal, respiratory or contagious and that the infant death-rate from congenital diseases was being reduced little, if at all. Congenital diseases, as a cause of infant deaths, furnish approximately 40 per cent of the mortality under one year of age. The importance of this subject, therefore, demands more definite recognition and action than it has had in the past. In fact, if the infant mortality-rate is to be still further reduced, it is quite evident that the supervision and instruction of expectant mothers or what is known as "prenatal work" must assume a more prominent position than it has heretofore held in public health activities.

This subject is of particular importance at this time owing to the inevitable reduction in the birth-rate that comes as a by-product of war. A report of the Registrar-General of England—Sir Bernard Mallett—calls attention to the fact that the fall in the birth-rate in England and Wales, based on the figures of 1913, has caused a loss of 650,000 potential lives. Sir Bernard states that they "never dreamed the birth-rate would reach such a level but, serious as is this loss to the coming generations of Great Britain, there is reason to believe that we have suffered less that the other belligerents. Germany has lost in potential lives the equivalent of 4.5 per cent of its total pre-war population or something like two million unborn lives; Austria has lost 5 per cent and Hungary 7 per cent. The present war has cost the belligerents not less than 12,500,000 potential lives." This country has been at war too short a time to compute accurately the effect upon our own infant death-rate, yet it is significant that in New York City alone there have been 2,804 fewer marriages and 410 fewer births during the first six months of this year as compared with the first six months of last year. A potential loss of life in the reduction of the birth-rate would seem inevitable in this country if the experience of Europe can be regarded as a criterion. It is, therefore, of the utmost importance that every effort should be made to keep alive and well the children who are born and in this effort prenatal work, or the prevention of deaths from congenital causes, assumes a place of tremendous proportion.

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* Guilfoy: "The influence of Nationality upon the Mortality of a Community," Monograph Series, Department of Health, New York City.

† Eastman: Health News, State Department of Health, N. Y. "Infant Mortality Statistics in New York State."

In this connection attention should be called to Senate Bill 4,782, introduced into the Senate on June 27 by Senator Robinson, entitled "A Bill to Encourage Instruction in the Hygiene of Maternity and Infancy, and to Extend Proper Care for Maternity and Infancy; to Provide for Coöperation with the States in the Promotion of Such Instruction and Care in Rural Districts; to Appropriate Money and Regulate Its Expenditure, and for Other Purposes." In brief, the bill provides for subsidizing the states up to a sum of $10,000 a year each, with the provision of an additional subsidy provided the state raises an equal amount of money to be used for the employment of rural nurses for prenatal instruction and maternity aid. The bill, which was introduced at the suggestion of Miss Julia C. Lathrop, chief of the Children's Bureau at Washington, should have the undivided support of all public health officials, for its passage will conserve child life at its beginning at a time in the history of the United States when such conservation is of the most vital importance.

S. J. Baker, M. D., D. P. H.

THE SANITATION AND SOCIALIZATION OF THE WESTERN PROVINCES OF CANADA.

The history of the American Public Health Association as set forth in the May number of the Journal helps us to visualize not only the progress of the science of sanitation during forty years, but also the settlement and development of the Western States then only begun, since the Union Pacific Railroad reached the Coast only in 1869. The history of the Western Canadian Provinces is still shorter by twenty years, and more in the matter of settlement, yet in the matter of government the large infusion of Eastern Canadians in the early years carried established forms and existing methods with them. The adaptation of such to the conditions of sparse settlement has proved an interesting study and in nothing more than in matter of public health. The Manitoba Board of Health was originally made up of five members, each located in some one of the five areas of the Province which they were supposed to supervise in emergencies. Later a Provincial bacteriologist gave such assistance as was possible with his many other duties. Three years ago a complete reorganization has resulted in the appointment of a minister of health with a secretary, an epidemiologist and well-equipped laboratory, with its director as chairman of the Board; while throughout the Province, through the enthusiasm of the chief executive officer in making local inspections, addressing school boards and other public bodies, applications are being made as fast as they can be filled by rural districts for the appointment of public health nurses. Thus not only are school children examined, the homes especially of recent immigrants visited, and vital statistics improved, but the social contact with officers above the jealousies and recriminations of small communities has a further direct uplifting socializing influence. In the next west Province of Saskatchewan, still sparser in settlement, its great area and purely agricultural character has developed legislation, probably the most advanced in its special application to rural needs, of any Province in Canada. With a population of 750,000 distributed over two hundred and fifty million square miles, Saskatchewan has had to deal not only with difficult fiscal and educational problems, but has also to care for the lives and social welfare of a people, a very large proportion of whom are foreign both in language and customs.

Physicians were and still are relatively few and serve areas often of a hundred miles square with till recently almost no central hospitals. Fortunately public health work began with a commissioner of health, an all-time officer, and both from his enthusiasm and the broad character of the duties gradually assumed, he has developed public health in Saskatchewan more closely into a department of government than in most other Provinces of Canada. His duties as inspector of public institutions have brought under his care the social needs of the rural population and such have become his special care. To assist physicians the idea of district hospitals has grown until some thirty rural areas, containing several counties, have applied and, after investigation as to convenience of site and buildings, have received permission to establish such hospitals aided with government grants, to which all physicians of the area may send patients, while a head nurse, with one or more assistants, not only manages the hospital, but also become public health visitors in the district. Thus physical and mental defects, so generally neglected, will be detected early and their correction ensured. The system is resulting directly in the establishing of institutions for the feeble-minded, deaf and dumb, and for the tuberculized, while broad legislation for dealing with venereal diseases is being put into effect through the hospital development.

Still more recent development is taking place in Alberta, a province of equal area, where a newly appointed minister of health is developing the idea of public health districts with all-time Provincial medical officers and visiting nurses for each; while a laboratory and the management of public institutions is giving an importance to the work scarcely surpassed by any older department of government.

Probably the most interesting, because the most difficult work, is seen in the Coast Province of British Columbia, with more than 600 miles from east to west and a yet longer coast line. This Province of mountains contains over 365,000 square miles, has three great mountain ranges running north and south with inumerable valleys, mostly narrow, but at times spreading out into great areas awaiting settlement and development. Barring fruit developments in the inland warm valleys and ranching in the dry belt, most of the population is gathered in coast towns and great mining camps, lumbering villages and fish cannery stations, the latter having temporary populations; but all have the special difficulties of a great floating population. In the early years of the Province wise provision was made for a few provincial hospitals, hundreds of miles apart in the great river valley districts where physicians were located and paid by government salary and such fees as they could collect, and these have formed centers for developing district public health work. Much of the coast work has to be reached by the coastal steamers of the chief transportation companies; while the medical officers of the large mining centers and those settlements or some port with a hospital and paid by the Indian Department to attend the Indians of a district, extend their work in coöperation with the Provincial Board of Health directly under the Minister of the Crown who administers the public institutions.

What perhaps makes all this western public health development most distinctive is the close relationship which exists in the minds of the government executive between the public health service and the charitable institutions, which in the old Eastern Provinces and States with long established institutions have hitherto been looked upon as a wholly separate function and duty of government. (*P. H. B.*)

WHY YOUR OCTOBER JOURNAL WILL BE LATE.

In order to give early publication to the papers of the next annual meeting, publication of the latter will be begun in the next issue of the JOURNAL. As these manuscripts must go to the printer later than the customary date, the October issue will be delayed in reaching the subscriber. It may even become necessary to combine two issues of the JOURNAL in order to compensate for lost time.

The difficult industrial conditions resulting from the new draft regulations are emphasized in the printing industry. Furthermore, the mails are slower than usual. We therefore solicit your patience when your JOURNAL comes late.

Editor.

◆

The Framingham Sickness Census.—Monograph No. 2 of the Framingham Community Health and Tuberculosis Demonstration, entitled "The Sickness Census" has recently been published. The work was undertaken for various reasons, among which were (1) the desire to obtain some idea of admitted illness in the community, and also very valuable general information; (2) to be able to compare the results of a similar survey at the end of the demonstration, with those found at the beginning. The sickness census was well advertised, and was conducted by insurance agents and nurses over a period of one to three weeks. Altogether 1,455 families were visited. This corresponded to 6,582 people. The workers were asked to include all minor ailments as well as serious sickness in the census.

Four hundred and seven cases of illness were found, a rate of 6.2 per hundred population. Some of the causes with percentage of total sickness were as follows: Typhoid fever 0.2 per cent, measles 0.5 per cent, scarlet fever 0.5 per cent, tuberculosis of the lungs 2.2 per cent, other forms of tuberculosis 1.7 per cent, rheumatism 6.6 per cent, headache 2.5 per cent, heart diseases 8.6 per cent, colds 13.5 per cent, bronchitis 3.9 per cent, "cough" 3.9 per cent, tonsilitis 2.2 per cent, diseases of the stomach 5.9 per cent, diseases of the kidneys 2.7 per cent, pregnancy 3.2 per cent.

Over 54 per cent of the sick were unable to work. A relatively high percentage of the sick—81.1 per cent—had a physician in attendance. From the point of view of age distribution, the older age groups showed unusually large sickness rates. Females were more affected than males, but if those illnesses associated with women be disregarded, their illness rate was 64.6 per thousand population as opposed to 53.1 for males. (*M. P. M.*)

In Memoriam

DR. EMMANUEL P. LACHAPELLE.

Born at Sault au Rècollet near Montreal in 1845, Dr. Lachapelle, an Honorary Member of the American Public Health Association and President of the Provincial Board of Health of Quebec, passed away at Rochester, Minnesota, on August 2, 1918, after an illness of over a year, full of years and honors, as the first physician amongst his many distinguished French Canadian confreres.

Educated in the schools and colleges of his own Province, Dr. Lachapelle for more than fifty years illustrated not only the highest ideals of his profession, but also, in a peculiar sense, the best instincts of a gentleman of the old French school.

Fortunate in having abundant means, Dr. Lachapelle devoted his early life not alone to establishing an enviable reputation as a medical practitioner, but also in advancing the scientific interests of the medical profession of his Province, and the academic interests of Laval University of whose medical school he was for some years the Dean. He was chiefly instrumental in placing Notre Dame Hospital on a high plane of efficiency and as chairman of the Medical Council promoted the efficiency of the whole profession in his Province.

But to the members of the American Public Health Association Dr. Lachapelle was best known for his work as a sanitarian. The Provincial Board of Health of Quebec was organized in 1886, the year after the memorable Montreal epidemic of smallpox. This Board organized on similar lines to other state boards of this continent has continued under his paternal guidance to develop along the most modern lines scientific work of inestimable benefit to the Province of Quebec. As President of the American Public Health Association in 1896, and as a member of the Executive, Dr. Lachapelle brought to its annual meetings his wide experience and mature judgment and it has only been in recent years when, as one of the city commissioners of Montreal his energies were taxed to the utmost, he was unable to give as steadily the benefit of his wise counsel.

As the leading member of the French Canadian profession, Dr. Lachapelle was recognized by the profession and government of France, which made him a *Chevalier de la legion d'Honneur* and *Un Officier de l'Academie de France.*

But with all his honors, worthily won, Dr. Lachapelle was ever to his friends the same modest, lovable embodiment of all that is implied in the term *un gentilhomme français.*

His energy was never flagging, and with unalterable purpose he strove for the realization of his ideals, the socializing and uplifting of his beloved French Canadian countrymen.

He was of the Gallican school and, while conservative in his methods, ever strove with clear vision to modernize a people in some measure hampered through race, language, and locality from benefiting through the energizing influences of a continent, fermenting with the bounding life, which millions of immigrants brought to its shores during a century.

How greatly he labored and how much he accomplished is known best to those who have seen his work during half a century. His private benefactions, his public gifts, his boundless patriotism earned for him the love of all; while many, and not the least his old companions in arms, will long cherish his memory. With them we would lay on his tomb *immortelles*, fragrant with perfume, to commemorate the life singularly sweet of *un homme sans peur et sans reproche.*

—Peter H. Bryce, M. D.

ASSOCIATION NEWS

By A. W. Hedrich, Secretary.

Dr. Frankel Addresses National Fraternal Congress.—On August 27, Dr. Lee K. Frankel, Treasurer of the Association, addressed the delegates of the National Fraternal Congress at Philadelphia, concerning support for the public health movement. Dr. Frankel pointed out that death-rates had been so much reduced through the activities of health officials, that it was possible to insure at much lower rates than formerly. Although insurance organizations, both old-line and fraternal, have greatly benefited through public health propaganda, they have in the past done relatively little to promote this cause. It was urged that inasmuch as further reduction of death-rates was of great importance to insurance companies, that the latter should lend their aid.

Dr. Frankel's remarks were very favorably received, and the executive committee of the Congress was instructed to study the whole matter and to formulate a plan of coöperation. As the membership of the various fraternal organizations represented in the Congress is very nearly 7,000,000, the support of the fraternal companies should have tremendous influence.

A more complete report will be rendered at the coming annual meeting.

⁂

Popular Health Journal.—The Secretary of the Association, recently conferred with the Editors of the *National Geographic* and *Popular Science* magazines, with the view to obtaining information concerning the value of a popular health journal.

Both editors believed that such a magazine could be made highly successful, and could accomplish much good in disseminating information concerning health.

The considerations of greatest importance at the present are the securing of an initial financial nucleus and the obtaining of print paper. The War Industries Board is at this time greatly restricting the use of print paper and is opposed to the institution of any new publications.

A committee report will be submitted to the Board of Directors at the annual meeting.

The Secretary wishes to publicly acknowledge the courtesy of Mr. Gilbert Grosvenor, Editor of the *National Geographic Magazine,* and of Mr. Waldemar Kaempffert, Editor of the *Popular Science Monthly.*

⁂

Thanks to Dr. Kober.—The welfare of the Association depends very largely upon the goodwill of its members. Very few new members come who have not been introduced by one of the present members. Among those to whom the Association is deeply indebted is Dr. George M. Kober, of Washington, D. C. A short time ago Dr. Kober sent us the names of nine of his best students in hygiene at Georgetown University, together with a check covering the first year's membership dues.

Another instance of generous service of this type was afforded when Dr. J. D. Robertson, Health Commissioner of Chicago, a few months ago sent seventeen new subscriptions to the Journal.

HELP WANTED

In order to help relieve the shortage of sanitarians due to the war, free help-wanted announcements will be carried in this column until further notice. Copy goes to the printer on the first of each month. In answering keyed advertisements, please mail replies separately.

The Health Employment Bureau also sends lists of applicants to prospective employers without charge.

Wanted: Assistant bacteriologist and pathologist for laboratory of City Department of Health. Young lady with technical training would be acceptable. Salary, $1,200 per year. Address Dr. R. L. Carlton, Health Officer, Winston-Salem, N. C.

Wanted: General inspector of foods and food handling establishments for City of Winston-Salem, N. C. Veterinarian preferred. Address R. L. Carlton, Health Officer, Winston-Salem, N. C.

Wanted: Chief chemist in Ohio Department of Health. Experience in drug work, feeding stuffs, and fertilizers required. Salary, $2,200 per year. Position to be filled for the period of the war. Address No. 157, V. H. L., care of this Journal.

Wanted: Epidemiologist for Department of Health in Michigan. Salary, $2,000 per year. Address No. 158, N. B. H., care of this JOURNAL.

Wanted: Interne for hospital in Michigan. Exceptional opportunity to gain experience in all branches of medicine and surgery. Salary, $75 per month. Address No. 159, N. B. H., care of this JOURNAL.

Wanted: Chemist to take charge of laboratory of a Connecticut water supply company. Must be qualified to make chemical, bacteriological, and biological tests. Salary, $1,800 per year. Address No. 160, C. H. B., care of this JOURNAL.

Wanted: Graduate veterinarian or other person trained to do milk and meat inspection in southern city near army camp. Salary, $150 per month. Address No. 161, W. D. H., care of this JOURNAL.

Wanted: Deputy commissioner of health in Michigan city. Salary, $3,000 per year. Address No. 162, W. F. W., care of this JOURNAL.

Wanted: Sanitary engineer in Michigan health department. Salary, $2,500 per year. Address No. 163, W. F. W., care of this JOURNAL.

Wanted: Man or woman as Social Service Director in tuberculous families. Salary, $1,500. Good future. Address Anti-Tuberculosis League, 209 W. Twelfth St., Cincinnati, Ohio.

*

Report on Industrial Morbidity Statistics.—A report of the Committee on Industrial Morbidity Statistics of the American Public Health Association is published in the issue of Public Health Reports dated August 30. Publication is in advance of the annual meeting of the Association, in order that the report may be discussed at the Chicago meeting.

The following were elected to membership in the Association in August, 1918:

W. A. Russell, M. D., Hardin, Mont.
P. H. McCarthy, M. D., Butte, Mont.
Clarence W. Buckmaster, M. D., Yonkers, N. Y.
Ernest S. Bishop, A. B., M. D., New York City.
Preston Alexander Frost, B. S., State College, Pa.
Roland W. Hall, M. D., Jackson, Miss.
Margaret Pierson, B. A., Chicago, Ill.
Eugene G. Peek, M. D., Ocola, Fla.
Robert Hamilton Coats, B. A., F. S. S., Rockleffe, Ottawa.
Wm. R. Warren, M. D., Key West, Fla.
Penn Mutual Life Insurance Co., Philadelphia, Pa.
William C. Fowler, M. D., Washington, D. C.
Elmer Patton Bostwick, Camp Meade, Md.
Guy Wm. Henika, M. D., M. P. H., Madison, Wis.
Oscar Caldwell West, M. D., Sanitary Inspector, Camp Stanley, Texas.
Abraham Resel Hollender, Ph. B., M. D., Linden, Wis.
Bernard Fantus, M. S., M. D., Chicago, Ill.
Wm. Spencer, Sanitary Engineer, Cherrydale, Va.
Alexander R. Craig, M. D., Chicago, Ill.
John V. Fowler, M. D., Chicago, Ill.
G. G. Craig, M. D., Rock Island, Ill.
Joseph F. Nagle, Renova, Pa.
Albert E. Marland, Washington, D. C.
John A. Nelson, Washington, D. C.
Grafton T. Brown, Washington, D. C.
John Shugrue, Washington, D. C.
William J. Corcoran, Old Forge, Pa.
Monterville G. Ewing, Jersey City, N. J.
Charles H. McEnerney, Ansonia, Conn.
Walter Rapapost, Washington, D. C.

University of Chicago. Fifty-eighth and Ellis Avenue.

PRELIMINARY PROGRAMS

OF THE

FORTY-SIXTH ANNUAL MEETING

OF THE

AMERICAN PUBLIC HEALTH ASSOCIATION

▽

CHICAGO, ILL.
OCTOBER 14TH TO 17TH
1918

▽

Official Headquarters: HOTEL MORRISON

PROGRAM OF THE FORTY-SIXTH ANNUAL MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION,

Chicago, Illinois, October 14–17, 1918

CALL TO MEETING.

The members of the American Public Health Association are hereby called to meet at Chicago, Ill., Oct. 14–17, 1918. Headquarters are to be at the Hotel Morrison.

Especial attention is called to proposed amendments to the constitution and by-laws of the Association, which will be submitted in accordance with a report of the Board of Directors accepted by the Association, at the last annual meeting. The proposed new constitution as presented by the Committee on Constitution is given below.

The more important of the proposed changes are briefly as follows:

Constitution.

Article 4 transfers election of the president, vice-president, and treasurer, from the Association to the Board of Directors.

Article 5 transfers the election of a portion of the Board of Directors from the Association to affiliated state health societies, upon a basis to be established by the Board of Directors. The terms of elective directors are changed from three to two years.

Nomination of officers and directors by the Advisory Council is discontinued.

Article 8 transfers the power to amend the constitution from the Association to the Board of Directors.

By-Laws.

Article 1. Active members are designated by the term *fellow*, but their status is otherwise unchanged.

A new type of membership is created; viz., associate membership. Dues are $1.00 annually, collectable through affiliated local societies. Subscription to the Journal is not included, but other printed matter may be sent.

Dues of sustaining members are increased from $25 to $50.

Article 3 defines the powers of the Board of Directors in somewhat greater detail, and increases the quorum from seven to ten directors.

Article 4 increases the Executive Committee from seven to nine members, by increasing the number of elective members from four to six. The terms of the latter are to be three years instead of one as heretofore, and are to expire in rotation.

Article 6 transfers the power to amend by-laws from the Association to the Board of Directors.

Additional amendments have been offered to the Committee and these will be submitted for consideration at the annual meeting.

The proposed constitution and by-laws including amendments follow:

AMERICAN PUBLIC HEALTH ASSOCIATION.

Constitution and By-Laws.

ARTICLE 1.

Name.

The name of this Association is The American Public Health Association.

ARTICLE 2.

Object.

The object of this Association is to protect and promote public and personal health.

ARTICLE 3.

Membership.

All persons and organizations in the United States of America, the Dominion of Canada, the Republic of Mexico, the Republic of Cuba, and other American nations, in sympathy with the object of the Association, are eligible to membership; provided, that honorary members may be elected without regard to their place of residence.

ARTICLE 4.

Officers.

The officers of this Association are a president, three vice-presidents, a secretary, and a treasurer. The president, vice-presidents, and treasurer shall be elected by the Board of Directors, and shall serve from the close of the annual meeting at which they are elected until the close of the next annual meeting, and until their successors are elected and qualified. The secretary shall be elected by the Board of Directors, and shall serve for such term as it may specify.

ARTICLE 5.

Administration.

Board of Directors. The affairs of this Association shall be administered by the Board of Directors, consisting of the officers, all ex-presidents, one member designated annually by each section, and additional directors elected by the affiliated health societies of the several states of the United States, of the several provinces of Canada, and of the several states or other political subdivisions of Mexico, Cuba, and other countries represented in the American Public Health Association. The number of such elected delegates to the Board shall not exceed 150. It shall be the duty of the Board of Directors at each annual meeting, to fix the basis of representation in such a way as to apportion the right to appoint delegates among the affiliated societies, in accordance with the membership in the American Public Health Association located in each society's district. The delegates shall be elected for two years.

ARTICLE 6.

Meetings.

Meetings of the Association shall be held at such times and places as may be directed under the by-laws. Twenty-five members shall constitute a quorum.

ARTICLE 7.

Saving Clause.

This constitution shall take effect immediately upon its adoption by the Association, but it shall not be construed to invalidate any act of the Association, or of any officer or committee thereof, done in accordance with the preceding constitution prior to or pending organization under this constitution.

ARTICLE 8.

AMENDMENTS.

This constitution may be amended by a two-thirds vote of the members of the Board of Directors present and voting at an annual meeting of the Association; provided, that the call for such meeting shall have specified the particular amendment which is to be acted upon, and provided also that no amendment shall be acted upon before the annual meeting following that at which it was proposed.

BY-LAWS.

ARTICLE 1.

MEMBERSHIP AND DUES.

Section 1. Membership is of four kinds: (1) Fellows; (2) Associate members; (3) Honorary members; (4) Corporate members; (5) Sustaining members.

A *fellow* is a person who has been elected to fellowship in accordance with the by-laws, who is an active worker in conservation of health, and who conforms to the constitution and by-laws of the association. An *associate member* is a person interested in conservation of health, who has been elected to associate membership in accordance with the by-laws, and who conforms to the constitution and by-laws of the Association. An *honorary member* is a person elected to membership of that class, by the Association for distinguished service to the objects for which the Association stands. A *corporate member* is a firm or corporation not engaged primarily in the conservation and promotion of public health, which has been elected to membership of that class by the Association in accordance with the by-laws. A *sustaining member* is a person who has been elected to membership in that class according to the by-laws.

Section 2. The dues of fellows are $5.00 a year; of associate members $1.00 a year; corporate members and sustaining members not less than $50.00 a year. Honorary members pay no dues. Dues are payable in advance.

Such part of each fellow's dues as may be determined by the Executive Committee shall be considered as payment of his subscription to the American Journal of Public Health.

The dues of the associate members shall be collected through the local societies. Such associate members are not entitled to the American Journal of Public Health. The publications of the Association other than the American Journal of Public Health, to which the associate members are entitled, shall be determined from time to time by the Executive Committee.

ARTICLE 2.

BOARD OF DIRECTORS.

The planning of the work of the Association, the management of the Association and its properties, the election of officers and committees, the apportionment of delegates among the several affiliated societies, the establishment of rules setting forth conditions of membership in societies, the observance of which shall be necessary for affiliation, and all other matters relating to administration of its affairs, shall be vested in the Board of Directors except as herein expressly provided.

The president of the Association shall be the presiding officer of the Board of Directors, and the secretary of the Association its secretary. The president, vice-presidents, secretary, and treasurer shall be ex-officio members of the Board. Ten directors shall constitute a quorum.

ARTICLE 3.

EXECUTIVE COMMITTEE.

There shall be an Executive Committee, consisting of nine members of the Board of Directors. The Board of Directors shall elect six members, and the president, secretary, and treasurer shall be members ex-officio. The six elective members shall serve three years, and two shall be elected at each annual meeting.

The executive work of the Association shall be performed by the Executive Committee; provided, that in the interim between meetings of the Committee, the president, secretary, and treasurer shall perform the executive work generally pertaining to their offices. Four members of the Executive Committee shall constitute a quorum.

ARTICLE 4.

MEETINGS.

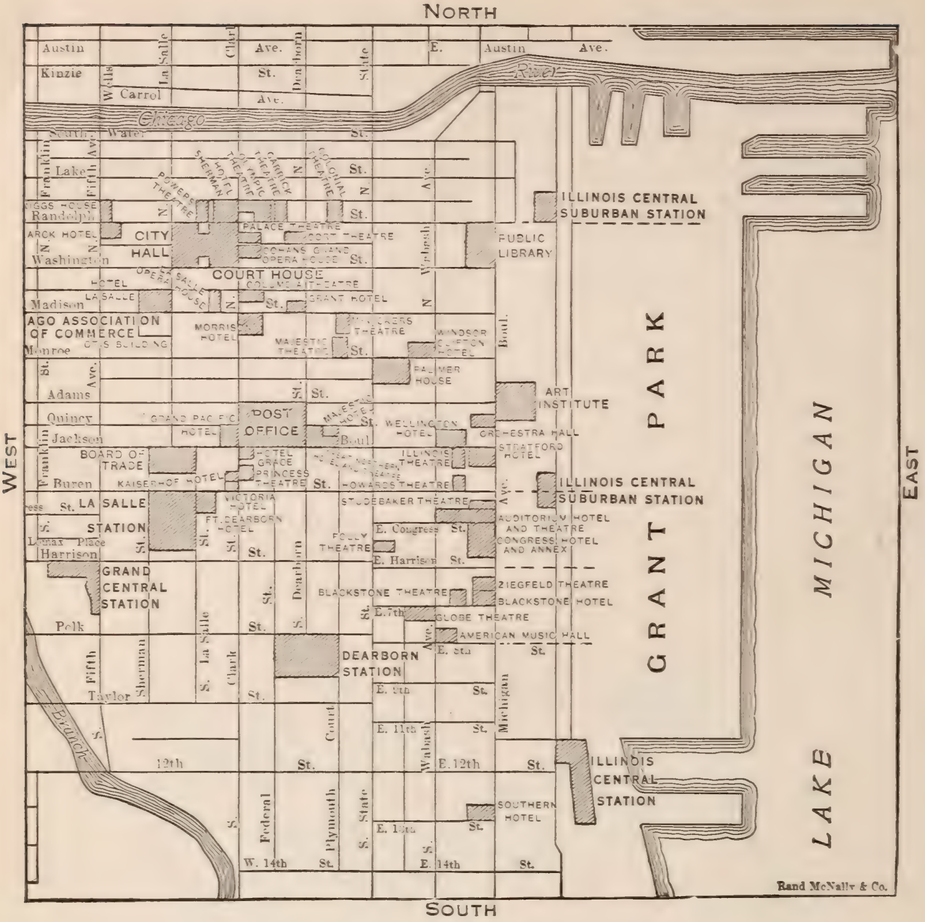
There shall be at least one stated annual meeting of the Association, at a place to be fixed by the Board of Directors. The time of the meeting shall be determined by the Executive Committee. Other meetings of the Association may be called by the Board at such times as it deems proper.

ARTICLE 5.

AMENDMENTS.

These by-laws may be amended by the vote of a majority of all the members of the Board of Directors present and voting at any annual meeting, the call for which shall have specified the particular amendment to be acted upon.

THE COLUMBUS CARAVEL IN JACKSON PARK.



Map of Business Section of Chicago.

CHICAGO HOTELS.

Auditorium, 430 So. Michigan Ave. A few double rooms available, $.90 and $1.00 per night for one person; $1.20 and $1.50 for two persons; $1.40 and $1.75 for three; $1.60 and $2.00 for four.

Bismarck (cap. 300): 171 W. Randolph St. Single room with bath, $1.50; single room without bath, $1.

Brevoort (cap. 500): 120 W. Madison St. Single room with bath, $2.50 and $3; single room without bath, $1.50.

Congress and Annex: Michigan Ave and Congress St. single room with bath $3.00 up; without bath, $2.00 up.

Grand Pacific (cap. 400): Jackson Boul. and Clark St. Single room with bath, $2 and up; single room without bath, $1.50 and $2.

La Salle (cap. 1,800): Madison and La Salle Sts. Single room with private bath, $3, $3.50, $4, and $5; single room with detached bath, $2, $2.50, $3.

Morrison (cap. 1,000): Clark and Madison Sts. Single room with bath, $2 and up.

Palmer House (cap. 1,000): State and Monroe Sts. Single room with bath, $2.50, $3, $3.50, $4, and $5; single room without bath, $1.50 and $2.

Sherman (cap. 1,500): Clark and Randolph Sts. Single room with bath, $2, $2.50, $3.50, $4, and $5.

Y. M. C. A. Hotel (cap. 1,000): 822 S. Wabash Ave. Rooms without bath for a single night, 75¢ and 85¢.

A list of private boarding houses will be available at headquarters.

HEADQUARTERS.

Headquarters will be on Floor B of the Morrison Hotel. All guests are requested to register whether members or not. Programs for all and badges for members will be given out upon registration. Announcements will also be posted here, and descriptive booklets regarding the places of interest in Chicago will be available for guests.

Monday morning, October 14, has been especially set aside for registration, although headquarters will be open throughout the sessions.

EXHIBITS.

Commercial exhibits will be found on Floor B of the Hotel Morrison. Prospective exhibitors are directed for space to Dr. A. R. Reynolds, 306 South Wabash Avenue, Chicago. A list of the exhibitors will be carried in the final program.

There will also be a scientific exhibit which will be found in the upper lobbies of the Morrison Hotel.

Our members will find both commercial and scientific exhibits of great interest and are urged to visit them.

PUNCTUALITY.

With one exception, meetings will begin at 9:00 a. m., 2:00 p. m., and 7:45 p. m. The general session on Tuesday afternoon will be called to order at 1:15 p. m., in order to adjourn in time for the boat ride. Members and guests are earnestly requested to arrive five minutes before, rather than after the stated time for opening meetings.

ADVISORY COUNCIL.

The Advisory Council is the nominating body of the Association.

In the Tuesday afternoon general session, the members will be asked to group themselves by states or provinces in order to elect representatives to the Advisory Council. The Advisory Council will meet on Wednesday at 5:00 p. m. in order to choose nominees for the offices of president, third vice-president, treasurer, and ten directors.

BOARD OF DIRECTORS.

The Board of Directors consists of the officers, all ex-presidents, a member designated annually by each section, and thirty additional directors, who serve for three years. Ten of these are elected by the Association each year.

The administrative affairs of the Association are entrusted to this body. In Chicago the Board of Directors will have two important sessions on Monday, October 14, at 10:00 a. m., and 2:00 p. m., respectively. There will be a luncheon for the directors at 12:30 p. m. As business of the most vital importance to the Association will be taken up, it is hoped that all directors attend these meetings without fail.

AMERICAN PUBLIC HEALTH ASSOCIATION

OFFICERS AND DIRECTORS 1917-1918

OFFICERS

President, Charles J. Hastings, M. D., Toronto, Ont.
First Vice-President, George M. Kober, M. D., Washington, D. C.
Second Vice-President, Manuel S. Iglesias, M. D., Vera Cruz, Mex.
Third Vice-President, Guilford H. Sumner, M. D., Des Moines, Iowa.
Treasurer, Lee K. Frankel, Ph. D., New York City.
Secretary, A. W. Hedrich, Boston, Mass.

EXECUTIVE COMMITTEE

Charles J. Hastings, M. D., Toronto, Ontario.
Lee K. Frankel, Ph. D., New York City.
W. A. Evans, M. D., Chicago, Illinois.
Peter H. Bryce, M. D., Ottawa, Ontario.
Guilford H. Sumner, M. D., Des Moines, Iowa.
A. W. Hedrich, Boston, Massachusetts.
J. N. Hurty, M. D., Indianapolis, Ind.

SECTION OFFICERS

Sanitary Engineering

Chairman, Mr. George S. Webster, Philadelphia, Pa.
Vice-Chairman, Mr. E. A. Fisher, Rochester, N. Y.
Secretary, Mr. Samuel A. Greeley, Chicago, Ill.

Food and Drugs

Chairman, Mr. Lucius P. Brown, New York City.
Vice-Chairman, Mr. John P. Street, New Haven, Conn.
Secretary, Dr. James O. Jordan, Boston, Mass.

Vital Statistics

Chairman, Dr. J. W. Trask, Washington, D. C.
V. Chairman, Louis I. Dublin, Ph. D., New York City.
Secretary, Mr. Richard C. Lappin, Washington, D. C.

Sociological

Chairman, Dr. Wm. F. Snow, Washington, D. C.
Vice-Chairman, Dr. Louis I. Harris, New York City.
Secretary, Dr. Ira S. Wile, New York City.

Public Health Administration

Chairman, Dr. Oscar W. Dowling, New Orleans, La.
V. Chairman, Dr. Francis Fronczak, Buffalo, N. Y.
Secretary, Mr. Chester H. Wells, Montclair, N. J.

Laboratory

Chairman, Dr. George W. McCoy, Washington, D. C.
V. Chair., R. B. Fitz-Randolph, Trenton, N. J.
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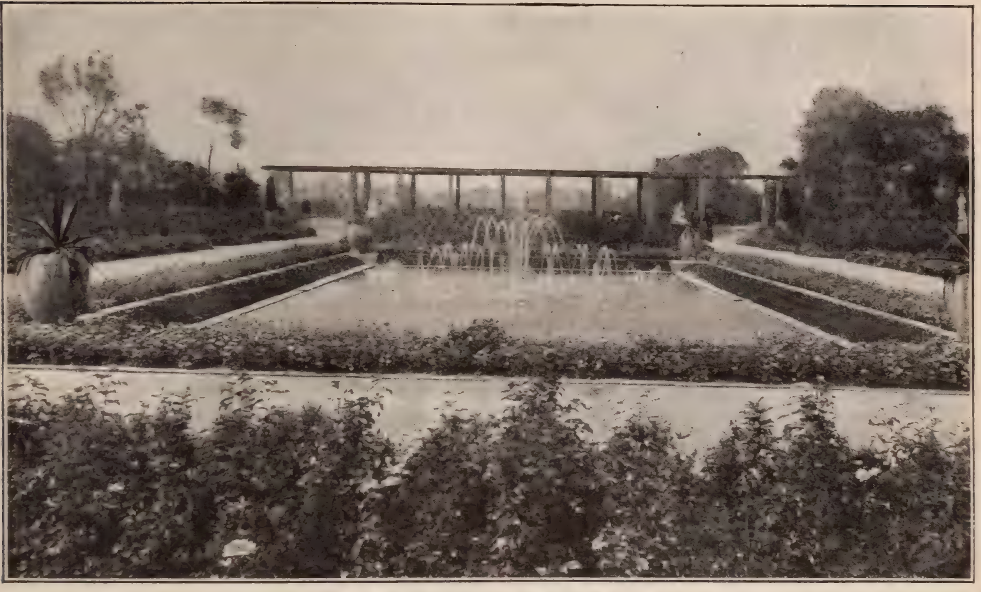
*Deceased



Scene in Humboldt Park.

ENTERTAINMENT PROGRAM.

On Tuesday afternoon, October 15, members and guests at the convention will be taken by boat on the Lake to a crib, and for a short distance down the Drainage Canal. Dinner will be served at the crib. Some of the points of interest will be:

The Chicago Sky Line	Entrance to the Harbor
View of the City Cribs	Municipal Pier
Water Intake and Pumping Station	River and Drainage Channel

The general session on Tuesday afternoon, October 15, will be adjourned promptly at 2:50 p. m. The party will then proceed north to the river dock at State Street from which the boat will leave promptly at 3:00 p. m. Guests are advised to bring overcoats.

Guests will be returned to the dock at State Street not later than 7:30 p. m.

Guests are also invited to inspect the State Penitentiary at Joliet, Ill., where a model of a new cell house is to be seen.

Other short trips will be announced at the meetings.

ENTERTAINMENT OF LADIES.

Women guests are welcome. There will be a committee for the entertainment of ladies. The entertainment program will be announced in the final program.

OTHER MEETINGS.

The International Association of Milk Inspectors will meet in Chicago, October 14, 15, and 16. Headquarters will be at Hotel Sherman. The secretary of the Association is Mr. Ivan C. Weld, 1120 Connecticut Avenue, Washington, D. C.

The American Association of Sanitary Engineers will meet in Chicago, October 14–15. The secretary of the Association is Mr. Thomas J. Claffy, Department of Health, Chicago.

PRELIMINARY PROGRAM OF THE GENERAL SESSIONS.

President, Charles J. Hastings, M. D., *Toronto, Ont.*
Vice-President, George M. Kober, M. D., *Washington, D. C.*
Secretary, A. W. Hedrich, *Boston, Massachusetts.*

First Session.

Monday, October 14, 7:45 p. m.

Presidential Address. Charles J. Hastings, M. D., *Toronto, Ontario.*
Address. W. A. Pusey, M. D., *President, Chicago Medical Society.*
Address. Arthur D. Bevan, M. D., *President, American Medical Association.*
Address. E. W. Fiegenbaum, M. D., *President, Illinois Medical Society.*
Reception.

Second Session.

Tuesday, October 15, 1:15 p. m.

Address. W. C. Gorgas, *Surgeon General, U. S. A.*
Report on Constitution. W. A. Evans, M. D., *Chicago, Illinois.*
Discussion and voting on constitution.
Election of Advisory Council.

At 2:50 p. m., the meeting will adjourn, and guests will be taken by boat on the Lake and up the Drainage Canal. See under "Entertainment."

Third Session.

Tuesday, October 15, 8:00 p. m.

The Health of the Civil Population in War Time. Victor C. Vaughan, *Colonel, Medical Corps.*
Some Public Health Problems and Opportunities Created by the War. William H. Welch, *Major, Medical Corps.*
Maintenance of Balance between Civil and Military Health Protection. W. A. Evans, M. D., *Chicago, Illinois.*
Address. Representative of the British Government.
Discussions.

Fourth Session.

Wednesday, October 16, 7:45 p. m.

Team-play for Public Health. George E. Vincent, *President, Rockefeller Foundation, New York City.*
The Future of the American Public Health Association. Lee K. Frankel, Ph. D., *Treasurer, American Public Health Association, New York City.*
The Accomplishments of Public Health. Statistical and Historical Evidence.
Discussions.

FIFTH SESSION.

Thursday, October 17, 1:00 p. m.

War-time Importance of Narcotic Drug Addiction. ERNEST S. BISHOP, *Professor of Clinical Medicine, New York University and Bellevue Hospital Medical College, New York City.*

A National Program for Physical Education. W. S. SMALL, M. D., *Bureau of Education, Washington, D. C.*

The Need of a Section on School Hygiene of the American Public Health Association. J. A. NYDEGGER, *Surgeon, U. S. P. H. S., Baltimore, Md.*

Committee reports.

Election of Officers and Directors.

PROGRAM OF THE SECTION ON PUBLIC HEALTH ADMINISTRATION.

Chairman, DR. OSCAR W. DOWLING, *New Orleans, La.*
Vice-Chairman, DR. FRANCIS E. FRONCZAK, *Buffalo, N. Y.*
Secretary, CHESTER H. WELLS, *Wilmington, Del.*

FIRST SESSION.

Monday, October 14, 2:00 p. m.

Minutes of last annual meeting.

Introduction of new business to be considered by the section before final adjournment.

Appointment of nominating committee.

Report of Committee on Standardizing the Work of Public Health Officials. LAWRENCE VEILLER, M. D., *New York City.*

Report of Committee on Rural Health Administration. G. F. RUEDIGER, M. D., *Reno, Nev.*

Rural Sanitary Privies. WARREN H. BOOKER, *State Board of Health, Raleigh, N. C.*

Scoring of Health Activities in Cities. PAUL B. BROOKS, M. D., *State Board of Health, Albany, N. Y.*

DISCUSSION: Opened by EUGENE R. KELLY, M. D., *State Board of Health, Boston, Mass.*

Taking the Board of Health to the People. B. L. ARMS, M. D., *City Bacteriologist, Jacksonville, Fla.*

Public Health Education—A Plea for a Public Health Magazine, to be published by the Health Authorities. B. LIBER, M. D., *New York City.*

SECOND SESSION.

Tuesday, October 15, 9:00 a. m.

Chairman's Address. OSCAR DOWLING, M. D., *New Orleans, La.*

Report of Committee on Venereal Disease. LT.-COL. W. F. SNOW, *Washington, D. C., Chairman.*

ALL PAPERS ARE LIMITED to 15 Minutes; DISCUSSIONS to 5 Minutes.

Report of Committee on National Program of Prenatal and Maternal Care. Major Haven Emerson, *Chairman.*

Report of Committee on Standard Regulations for the Control of Communicable Diseases. Major Haven Emerson, *Chairman.*

The Relation of War to the Conservation of Child Life. S. Josephine Baker, M. D., *Department of Health, New York City.*

War Program of the Federal Children's Bureau. Dr. Anna E. Rude, *Director, Hygiene Division, Federal Children's Bureau.*

Venereal Diseases. John Dill Robertson, M. D., *Commissioner of Health, Chicago, Ill.*

Vaccination as a War Measure. Maurice Ostheimer, M. D., *Commissioner of Health, Philadelphia, Pa.*

Discussion: Opened by Albert J. Bell, M. D., *Cincinnati, O.*, and S. S. Woody, M. D., *Philadelphia, Pa.*

Report of Nominating Committees, and Election of Officers.

Third Session.

Wednesday, October 16, 2:00 p. m.

Joint Session with Laboratory Section.

Fourth Session.

Thursday, October 17, 9:00 a. m.

Fashions as Affecting Public Health. Jeannette Throckmorton, M. D. *Chariton, Ia.*

Public Health Nursing in the Extra Cantonment Zone. Miss Mary E. Lent, *United States Public Health Service.*

Prevalence of Goiter in West Virginia. Mayo Tolman, *Charleston, W. Va.*

New Evidence on the Cause of Tuberculosis (Stereopticon illustrations). Burton R. Rogers, D. V. S., *New York City.*

Report of Committee on Closing Schools during Epidemics. W. S. Small, M. D., *Bureau of Education, Washington, D. C., Chairman.*

Interesting Experiences of Public Health Officials. Volunteer speakers from the floor.

PRELIMINARY PROGRAM OF THE LABORATORY SECTION.

Chairman, G. W. McCoy, M. D., *Washington, D. C.*
Vice-Chairman, R. B. Fitz-Randolph, M. D., *Trenton, N. J.*
Secretary, Charles Krumwiede, Jr., M. D., *New York City.*

First Session.

Tuesday, October 15, 9:00 a. m.

Address of Chairman.

Reports of Committees.

Suggested Modifications of the Standard Method for the Study of the Dust Content of Air. Henry Field Smyth, *Acting Director, Laboratory of Hygiene, University of Pennsylvania, Philadelphia.*

ALL PAPERS ARE LIMITED to 15 Minutes; DISCUSSIONS to 5 Minutes.

Disinfection of Drinking Water by Hypochlorite, Permanganate, Halozone and Citric Acid. B. FANTUS, *Chicago, Ill.*

SECOND SESSION.

Wednesday, October 16, 2:00 p. m.

Joint Session with Public Health Administration Section.

On the Relative Frequency of Hemolytic Streptococci in Normal Throats. B. J. CLAWSON, *Department of Hygiene and Bacteriology, University of Chicago, Chicago, Ill.*

Observations on the Avian Paratyphoid Bacilli. F. W. MULSOW, *Department of Hygiene and Bacteriology, University of Chicago, Chicago, Ill.*

On Toxic Products which May be Present in Heated Milk and their Relation to Pasteurization. WILLIAM W. FORD, *School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.*

On the Presence of Methyl Red Negative Organisms in the Intestinal Tract and Its Bearing upon the Problem of Water Examination. WILLIAM W. FORD, *Baltimore, Md.*

Factors which Influence the Thermal Death Point of B. Botulinus in Canning. R. E. BUCHANAN and PAUL ORR.

Relative Value of Culture and Inoculation Tests in the Detection of Tetanus Spores. I. A. BENGSTON and G. W. McCOY, *Hygienic Laboratory, Washington, D. C.*

Detection of Anthrax Infection in Shaving Brushes. J. P. LEAKE and ARTHUR LEDERER, *Hygienic Laboratory, Washington, D. C.*

THIRD SESSION.

Thursday, October 17, 9:00 a. m.

A Rapid Method for the Identification of Bacteria Fermenting Carbohydrates. J. BRONFENBRENNER, PH. D., and M. J. SCHLESINGER, *Harvard University Medical School, Boston, Mass.*

The Preparation of Milk-Whey as Culture Medium. J. BRONFENBRENNER. PH. D., C. R. DAVIS and K. MORISHIMA.

Carbohydrate Fermentation by Bacteria as Influenced by the Composition of the Medium. J. BRONFENBRENNER, PH. D., and M. J. SCHLESINGER.

Spontaneous Agglutination as a Factor Interfering with the Identification of Bacteria. O. ISHII and M. J. SCHLESINGER.

Notes on Some Indicators for Titrating Bacteriologic Media. J. F. NORTON, *Department of Hygiene and Bacteriology, University of Chicago, Chicago, Ill.*

Further Experiences with the Methylene Blue-Eosin Medium for the Isolation of Typhoid and Paratyphoid Bacilli. JOHN B. HAMILTON, *State University of Iowa, Iowa City, Iowa.* By Invitation.

Observations on the Rate of Growth of B. Coli. R. C. SALTER.

ALL PAPERS ARE LIMITED to 15 Minutes; DISCUSSIONS to 5 Minutes.

PRELIMINARY PROGRAM OF THE SOCIOLOGICAL SECTION.

Chairman, Wm. F. Snow, *Lt.-Col., M. C., Washington, D. C.*
Vice-Chairman, Louis I. Harris, M. D., *New York City.*
Secretary, Ira S. Wile, M. D., *New York City.*

First Session.

Monday, October 14, 2:00 p. m.

What Is the Relation of Wages to Public Health?

The Relation of Wages to Public Health. B. S. Warren, *Assistant Surgeon-General, Public Health Service, Washington, D. C.*

The Relation of Wages to Public Health as Viewed by Labor. Arthur E. Holder, *Member Federal Board for Vocational Education, Washington, D. C.*

The Relation of Wages to Infant Mortality. Miss Julia Lathrop, *Director, Federal Children's Bureau, Washington, D. C.*

Discussant, H. A. Millis, *Secretary, Illinois Health Insurance Commission, Chicago, Ill.*

Second Session.

Tuesday, October 15, 9:00 a. m.

How May Hospital and Dispensary Organizations be Re-constructed for Increased Social Efficiency?

Group Medicine. Michael M. Davis, *Director, Boston City Dispensary, Boston, Mass.*

Discussant, W. A. Sawyer, *Major, M. C., Washington, D. C.*

Corporation Hospitals and Dispensaries. Harry E. Mock, *Lieutenant-Colonel M. C., Washington, D. C.*

Discussant, Loyal A. Shoudy, *Chief Surgeon, Bethlehem Steel Company, Pittsburgh, Pa.*

Hospital and Dispensary Organizations. R. A. Bolt, *Chief of Bureau Child Hygiene, Department of Public Welfare, Division of Health, Cleveland, O.*

Third Session.

Wednesday, October 16, 9:00 a. m.

What Adjustment in Health Administration Must be Made as a Result of War Conditions?

Venereal Diseases. William F. Snow, *Lt.-Col. M. C., Washington, D. C.*

Discussant, S. J. Crumbine, *Secretary, Kansas State Board of Health, Topeka, Kans.*

Tuberculosis. Donald B. Armstrong, M. D., *Executive Officer, Community Health and Tuberculosis Demonstration, Framingham, Mass.*

Discussant, Hoyt E. Dearholt, M. D., *Executive Secretary, The Wisconsin Anti-Tuberculosis Association, Milwaukee, Wis.*

Industrial Accidents and Diseases. Emery R. Hayhurst, M. D., *Consultant, Division of Industrial Hygiene, Ohio State Department of Health, Columbus, O.*

Fourth Session.

Thursday, October 17, 9:00 a. m.

Round Table Discussion—What is the Effect of the High Cost of Living on Public Health?

Leaders:
John Dill Robertson, M. D., *Commissioner of Health, Chicago, Ill.*
Louis Harris, M. D., *Director, Bureau of Preventable Diseases, New York, N. Y.*
E. R. Kelley, M. D., *State Commissioner of Health, Boston, Mass.*

PRELIMINARY PROGRAM OF THE SECTION ON INDUSTRIAL HYGIENE.

Chairman, G. M. Price, M. D., *New York City.*
Vice-Chairman, J. W. Schereschewsky, M. D., *Washington, D. C.*
Secretary, Francis D. Patterson, M. D., *Harrisburg, Pa.*

First Session.

Monday, October 14, 2:00 p. m.

The Problems of Industrial Hygiene.

The Problems of Industrial Hygiene. George M. Price, M. D., *New York, N. Y.*

The Problem of Organic Dust in Modern Industries. Frederick L. Hoffman, LL. D., *Newark, N. J.*

The Problem of Industrial Poisons. J. W. Schereschewsky, M. D., *Washington, D. C.*

The Problem of Industrial Fatigue. Frederic Lee, M. D., *New York, N. Y.*

The Problem of Compensation for Industrial Disease. Frederic L. Van Sickle, M. D., *Olyphant, Pa.*

The Problem of Women in Industry. Elizabeth B. Bricker, M. D., *Director, Division of Woman and Child Labor, Department of Labor and Industry, Harrisburg, Pa.*

Second Session.

Tuesday, October 15, 9:00 a. m.

The Problems of the War Industries.

The Explosives Industry. W. G. Hudson, M. D., *New York City and Wilmington, Del.*

The Textile Industry. A. J. Lanza, M. D., *Pittsburgh, Pa.*

The Dye Industry. Alice Hamilton, M. D., *Chicago, Ill.*

The Steel Industry. Loyal A. Shoudy, M. D., *Bethlehem, Pa.*

The Shipbuilding Industry. Lieutenant-Col. Philip S. Doane, *Philadelphia, Pa.*

Third Session.

Wednesday, October 16, 9:00 a. m.

Industrial Hygiene in Relation to the Efficiency of the Worker.

Housing. Royal Meeker, M. D., *Washington, D. C.*

Lighting. Professor C. E. Clewell, *Philadelphia, Pa.*

The Relation of the Federal Compensation Act to the Health and Welfare of Civil Employees of the U. S. Government. J. W. Trask, M. D., *Washington, D. C.*

The Clinic for Vocational Diseases. Louis I. Harris, M. D., *New York.*

Industrial Medicine and Surgery in Relation to War and Production. Otto P. Geier, M. D., *Cincinnati, O.*

Organization of the Works for Industrial Hygiene. C. K. Drinker, M. D., *Harvard Medical School, Boston, Mass.*

ALL PAPERS ARE LIMITED to 15 Minutes; DISCUSSIONS to 5 Minutes.

PRELIMINARY PROGRAM OF THE SECTION ON VITAL STATISTICS.

Chairman, John W. Trask, M. D., *Washington, D. C.*
Vice-Chairman, Louis I. Dublin, Ph. D., *New York, N. Y.*
Secretary, Richard C. Lappin, *Washington, D. C.*

First Session.

Monday, October 14, 2:00 p. m.

Registration of Births and Deaths in Illinois. C. St. Clair Drake, *State Health Commissioner, Springfield, Ill.*

An Inquiry in the Reliability of Causes of Death. Louis I. Dublin, Ph. D., and George H. Van Buren.

Election of Nominating Committee.

Report of the Committee on Institutional and Hospital Statistics.

Report of the Committee on Morbidity Reports and Statistics. A. J. Chesley, M. D., *Chairman.*

Report of the Committee on Membership. Charles F. Bolduan, M. D., *Chairman.*

Report of the Committee on the Accuracy of Certified Causes of Death and its Relation to Mortality Statistics and the International List. Haven Emerson, M. D., *Chairman.*

Report of the Committee on Legislation. Charles V. Chapin, M. D., *Chairman.*

Second Session.

Tuesday, October 15, 9:00 a. m.

Report of Nominating Committee and Election of Officers and Section Council.

Report of Committee on Morbidity Records and Mortality Statistics in Industry. Louis I. Dublin, Ph. D., *Chairman.*

Difficulties Encountered in Allocating Nonresident Deaths in the State of New York. Otto R. Eichel, M. D.

Relation of Vital Statistics to Public Health Administration. W. F. Petrie.

Collection of Birth Records in Thinly Settled Communities. L. W. Feezer.

Report of the Committee on Amendments to the Standard Certificate of Birth. William H. Davis, M. D., *Chairman.*

Third Session.

Wednesday, October 16, 2:00 p. m.

The Pioneer Registration State of the West. W. F. Petrie.

Report of the Committee on Registration Affairs. William H. Davis, M. D., *Chairman.*

Report of the Committee on the 1920 Census and its Relation to Vital Statistics. Wm. H. Guilfoy, M. D., *Chairman.*

Family Statistics from Registration Sources. Edwin W. Kopf.

Coöperation of State and Federal Governments in the Registration of Births and Deaths. Jno. Emerson Monger, M. D.

Birth Registration in Connecticut. James P. Balfe.

ALL PAPERS ARE LIMITED to 15 Minutes; DISCUSSIONS to 5 Minutes.

FOURTH SESSION.

Thursday, October 17, 9:00 a. m.

Report of Section Council and Nomination of Standing Committees for Ensuing Year.

The Toll of the Degenerative Diseases, with a Plan for its Reduction. E. B. FINK.

One Year of Infant Mortality in the United States during War. FREDERICK S. CRUM, PH. D.

Report of the Committee on Forms and Methods of Statistical Practice. WALTER F. WILLCOX, PH. D., *Chairman.*

Report of the Committee on Nonresident Deaths. W. R. BATT, M. D., *Chairman.*

Report of the Committee on Resolutions. WM. H. GUILFOY, M. D., *Chairman.*

Unfinished Business.

PRELIMINARY PROGRAM OF THE SECTION ON FOOD AND DRUGS.

Chairman, LUCIUS P. BROWN, *New York City.*
Vice-Chairman, JOHN P. STREET, *New Haven, Conn.*
Secretary, JAMES O. JORDAN, *Boston, Mass.*

FIRST SESSION.

Monday, October 14, 2:00 p. m.

General Considerations on War-time Foods.

The Food-supply of the United States after a Year of War. Address of chairman. LUCIUS P. BROWN, *Director, Bureau of Food and Drugs, Dept. of Health, New York City.*

Reports of committees on the following:

Conservation and Development of Food Supplies. PETER H. BRYCE, M. D., *Chief Medical Officer, Canada Immigration Service, Ottawa, Ont.*

Municipal Food Administration. OLE SALTHE, *Assistant Director, Bureau of Food and Drugs, Dept. of Health, New York City.*

Nutritional Problems. HENRY C. SHERMAN, *Professor of Food Chemistry, Columbia University, New York City.*

Papers, as follows:

What is a "Balanced Ration"?

Why the Maintenance of the Dairy Industry is Paramount for a Nation at War. CHARLES E. NORTH, M. D., *Director, The North Public Health Bureau, New York City.*

The Real Relation of Foods and Food Inspection to the Public Health.

SECOND SESSION.

Tuesday, October 15, 9:00 a. m.

The Civilian's Foods in War-time.

Reports of committees on the following:

Preparation, Packing, and Transportation of Foods. LESTER A. ROUND, *Bacteriologist, Bureau of Chemistry, U. S. Department of Agriculture, Washington, D. C.*

Relation of Food to Disease. MILTON J. ROSENAU, M. D., *Professor of Preventive Medicine and Hygiene, Harvard Medical School, Boston, Mass.*

Retail Distribution and Marketing of Foods. MISS MARION TALBOT, *Professor of Household Administration, Univ. of Chicago, Chicago, Ill.*

Papers, as follows:

A Year's Changes in Food Habits.

Meats—The Present Aspect of Supply, Conservation and Development. W. H. LIPMAN, M. D., *Medical Director, Swift & Co., Chicago, Ill.*

The Inter-relation of the Controls of Quantity and Purity of Foods—What are the Irreducible Minima of the Latter Necessary in War-time? H. E. BARNARD, PH. D., *State Food and Drug Commissioner; Federal Food Administrator for Indiana, Indianapolis, Ind.*

"*Ersatze*" and Surrogates; some Lessons from Europe.

THIRD SESSION.

Wednesday, October 16, 9:00 a. m.

Reports of committees on the following:

Drugs and Nostrums. ARTHUR J. CRAMP, M. D., *Director of the Propaganda for Reform Department of The Journal of the American Medical Assn., Chicago, Ill.*

Habit Forming Drugs. EDWARD GUION, M. D., *Physician and Sanitarian, U. S. Army Base Hospital, Camp Wheeler, Ga.*

Control of Milk and Dairy Products. PROF. H. A. HARDING, *Dairy Bacteriology, College of Agriculture, University of Illinois, Urbana, Ill.*

Papers, as follows:

Price Control of Foods—Why is it Justified?

The Supply of Pharmaceuticals and Medicines in War-times; Its Importance and Dangers. PROF. CHARLES H. LAWALL, *Dean, Philadelphia College of Pharmacy, and Analytical Chemist, Philadelphia, Pa.*

Legitimate Use of Narcotics in War-time. DR. ERNEST S. BISHOP, *New York City.*

Two War Jokers (in Narcotics). MISS JEANNETTE MARKS, *The President's House, South Hadley, Mass.*

The Relation of Modern Advertising to the Nostrum Evil. ARTHUR J. CRAMP, M. D., *Director, Propaganda for Reform Dept., Journal of the American Medical Assn., Chicago, Ill.*

FOURTH SESSION.

Thursday, October 17, 9:00 a. m.

The Soldier's Food.

Reports of committees on the following:

Problems of Canning. WILLARD D. BIGELOW, *Chief Chemist, National Canners' Assn., Washington, D. C.*

Cold Storage. HERMANN C. LYTHGOE, *Director, Division of Food and Drugs, State Department of Health, Boston, Mass.*

Meat Inspection. M. DORSET, *Chief, Biochemic Division, U. S. Department of Agriculture, Washington, D. C.*

Papers, as follows:

The Fighter's Food Needs. JOHN R. MURLIN, *Lieutenant-Colonel Sanitary Corps, U. S. A., Chief, Division of Food and Nutrition, Office of the Surgeon-General, Washington D. C.*

Hospital Food Needs. Major R. G. Hoskins, *Sanitary Corps, Div. of Food and Nutrition, Office of The Surgeon General, Washington, D. C.*

Conservation in Camp Feeding.

The Organization of an Army's Food Supply. Speaker to be assigned by the Quartermaster General, U. S. Army.

PRELIMINARY PROGRAM OF THE SANITARY ENGINEERING SECTION.

Chairman, George S. Webster, *Philadelphia.*
Vice-Chairman, E. A. Fisher, *Rochester, N. Y.*
Secretary, Samuel A. Greeley, *Chicago, Ill.*

Wednesday, October 16, 9:00 a. m. and Thursday, October 17, 9:00 a. m.

Committee on Air Supplies. Prof. F. H. Bass, *Minneapolis, Minn., Chairman.*

Committee on Water Supplies. F. F. Longley, *N. Y., Chairman.* Edward E. Wall, *St. Louis, Mo., Acting Chairman.*

Committee on Sewerage and Sewage Disposal. Kenneth Allen, *New York City, Chairman.*

Committee on Sanitary Control of Waterways. H. P. Eddy, *Boston, Mass., Chairman.*

Committee on Refuse Collection and Disposal. Samuel A. Greeley, *Chicago, Chairman.*

Committee on Street Cleaning. Richard T. Fox, *Acting Chairman.*

Committee on Constitution. Samuel A. Greeley, *Chicago, Chairman.*

Committee on Works Operation and Analytical Methods. Chas. B. Hoover, *Columbus, Ohio, Chairman.*

Committee on Plumbing and Drainage of Buildings. No Chairman.

Committee on Milk Pasteurization. H. A. Whittaker, *State Sanitary Engineer, Minneapolis, Minn., Chairman.*

The Work of the Department of Health and Sanitation of the U. S. Shipping Board. P. S. Doane, *Lieutenant-Colonel, Philadelphia, Pa.*

The Sewage Treatment Problem in Chicago. C. D. Hill, *Engineer, Board of Local Improvements, Chicago, Ill.*

Dissolved Oxygen as an Index of the Pollution of New York Harbor. Kenneth Allen, *New York City.*

Recognition Given Sanitary Engineering Work in the Government War Activities. George W. Fuller, *New York City.*

The Chlorination of the Chicago Water Supply. John Erickson, *Chicago, Ill.*

Chemical Control of Water Chlorination. W. J. Allen.

Garbage Improvement at Louisville. Samuel A. Greeley, *Chicago, Ill.*

Sanitation and Conservation in the Municipal Utilities of Rochester, N. Y. Edwin A. Fisher and John F. Skinner, *Rochester, N. Y.*

————. Prof. E. B. Phelps, *Hygiene Laboratory, Washington, D. C.*

ALL PAPERS ARE LIMITED to 15 Minutes; DISCUSSIONS to 5 Minutes.

PUBLIC HEALTH NOTES

Abstracted by DAVID GREENBERG and M. P. HOROWITZ.

California.—The State Board of Health has initiated a campaign to enlist the voluntary coöperation of the druggists throughout the state, in eliminating the counter-prescribing evil; much after the same method that has proved so successful in Michigan, where the pharmacists refuse to sell drugs to combat venereal disease except on a physician's prescription. (*D. G.*)

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Illinois.—Dr. Heman Spalding, of the Chicago Department of Health, is in charge of Camp Steever's sanitary and surgical needs. Camp Steever is a military training camp for high school boys. The Government furnishes a U. S. Army officer as commander.

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Kansas.—Kansas was officially admitted into the birth registration area of the United States, on May 13, 1918, being the fifteenth state thus admitted.

The State is coöperating with the Food Administration, in endeavoring to minimize the unnecessary loss of all food stuffs. Probably the greatest uncalled-for loss of any food is that of the egg. If each purchaser except the consumer will candle, and pay only for the good eggs, the producer will be induced to take better care of his eggs so as to curtail such loss. On this theory the following resolution was passed by the State Board of Health:

"*Resolved*, That all buyers of eggs, except the consumer, shall candle every lot of eggs bought except those eggs that have been previously candled and maintained at a temperature of 40° F. or below; provided, that eggs that are produced between the first day of November and the first day of March are not required to be candled. An egg-candling certificate is required to be placed on the top flat of each case of eggs candled, and resold by the case. It shall show the date candled; by whom; the firm or corporation name, and license number. The form adopted by the United States Food Administration is adopted by this board." (*D. G.*)

Louisiana.—At a recent meeting of the General Assembly, some important public health measures were enacted. Venereal diseases are now to be controlled. Each parish and municipality must maintain a board of health. Better control over the sale of narcotics is now made possible. The Model Law has received official enactment.

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Dr. Dowling has completed an itinerary of five of the large cities of the State in which he presented the war film "Fit to Fight." This is the opening gun of the campaign against venereal disease, and the attendance at these meetings has been most gratifying.

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That evidence might be had from disinterested authorities concerning the therapeutic value of four widely advertised preparations, the formula and advertising matter on the labels of each were copied. A questionnaire with request for reply, and a brief explanation of the purpose of the inquiry was sent to physicians in charge of the Therapeutical Department in universities having "A" rank throughout the United States and to other physicians of like standing.

These preparations are recommended, two for internal and two for external use. The questions were formulated from the advertising matter.

Condemnation is almost universal and unqualified, and is a clear indication of the judgment of the best medical men in the United States. (*D. G.*)

⁂

Health Survey of New Orleans, La.—Acting with the City Board of Health and with the approval and coöperation of the Hon. Martin Behrman, Mayor of New Orleans, the Metropolitan Life Insurance Company is making a comprehensive health survey of that city. Walter L. Dodd, who has had large experience in such work, is in immediate charge of it. The entire force of the City Board of Health has been placed at Mr. Dodd's disposal, and if their coöperation is found desirable, the staff of the Metropolitan in that city will be used. It is believed that this inspection will be the most comprehensive sanitary inquiry ever undertaken in a city of the size of New Orleans.

Broadly speaking, the inquiry is first as to the death-rate—to find the various causes of disease by districts, to trace the effect of each disease, to ascertain what has been done to combat it.

A canvass of many portions of the city has been undertaken to ascertain the necessity for sanitary reforms, and remedies will be suggested wherever it is discovered that disease has been spread which might easily have been prevented by cleanliness and a proper observance of natural laws.

The birth-rate is being thoroughly investigated, and if it is below normal, a cause will be sought. The systems of garbage disposal and sewerage are receiving minute attention.

Especial attention is to be given to infectious or contagious diseases, and methods will be suggested to either eliminate or arrest them when the cause or source has been ascertained.

School arrangements from a sanitary standpoint, and in this connection, diseases among children, the proper inspection of all public places, the source of food supplies and the methods of handling such supplies will be covered by the investigation.

The City Board of Health itself is coöperating in carefully scrutinizing its own methods, and suggestions that may prove helpful will be welcome.

The entire work is undertaken not in any spirit of criticism, but from a constructive point of view. It is taken up, not only by wards and precincts, but by city blocks, and in many sections each house will receive a thorough examination. It is believed by the Mayor and by the city health authorities that valuable data will be obtained which will be of assistance in solving many problems affecting public health.

One result which will be incidental, it is expected, will show the bearing which sanitary conditions have on the difference in the death-rate between the white and colored portions of the population.

The advantages of the health survey, it is expected, will be not only in improved health conditions, and the lower death-rate, but will have a commercial value for the city. A clean bill of health and modern sanitary conditions, it has been found, figure in many propositions involving large numbers of visitors to a city, such as great conventions and the location of large plants which, during the war, are either controlled or supervised by the Government. The expense of the survey to the community has been carefully calculated, and in comparison with the results sought to be achieved, it is considered trifling.

The main thing, of course, is a reduction in the death-rate for the future, which may result from a scientific study of all the conditions under which the population now lives.

⁂

Maine.—Mr. A. P. Pratt, C. P. H., formerly district health officer of the State Department of Health with residence in Portland, Maine, has resigned his position to enter the Sanitary Corps of the United States Army.

Mr. William H. Greenleaf, formerly Director of the Division of Education and Publicity of the State Department of Health, has gone West to be inducted into military service.

On the joint request of the State Department of Health and the Maine Anti-Tuberculosis Association, Governor Milliken has appointed a committee on Health Centers for the State, the personnel of which is as follows: Mr. Hiram W. Ricker, So. Poland and Dr. Sylvester J. Beach of Augusta, representing the State Public Health Council; Dr. E. B. Merrill of Foxcroft and Mrs. Howard R. Ives of Portland, representing the Maine Anti-Tuberculosis Association; Mrs. George S. French of Portland representing the Maine State Sanitoria; Dr. W. E. Elwell of Portland, representing the newly created child-welfare organization; Dr. G. H. Coombs of Waldoboro and Dr. Bertrand L. Bryant of Bangor, representing the Maine Medical Society; and Mr. John Wilson of Bangor. The chief purpose of this committee will be the coöperation with the State Department of Health and the Maine Anti-Tuberculosis Association, in furthering the interests of the venereal disease and tuberculosis campaigns which will be carried on throughout the State. As a war measure, this committee is asking all hospitals throughout the State to make available the necessary space in their building, and if possible to create out-patient departments for the care and treatment of venereal diseases and tuberculosis.

Dr. J. F. Stevens of Millinocket has been appointed District Health Officer, to have charge of the Northern health district to take the place of Dr. H. E. Hitchcock, who was recently made Director of the Division of Venereal Diseases.

(*L. D. Bristol.*)

⁂

Massachusetts.—An important organization was effected in Boston last month when the Massachusetts Health Committee was formed to coöperate in an educational campaign with all other agencies, which seek to make Uncle Sam's boys fit to fight, and to cut down the sickness and death-rate for the Commonwealth.

The Committee has a working fund which will enable it to carry on a vigorous campaign of lectures, exhibits, newspaper publicity, and circular work. It will serve in an advisory capacity to less experienced organizations and will try to become a clearing house for public health ideas.

The officers of the Committee are as follows:

Dr. Eugene R. Kelley, State Commissioner of Health, chairman; Miss Gertrude W. Peabody, vice-chairman of the Child Welfare Department of the Council of National Defence, treasurer; Professor Charles E. Bellatty of Boston University, director.

The director is a publicity engineer of high standing. His help and advice should be of material benefit to workers for the common health wherever publicity problems are presented. He will maintain an organization at the College of Business Administration of Boston University, 525 Boylston Street, Boston, telephone Back Bay 8810. All who feel that the committee can render service in their community should call for that service without hesitation.

Other members of the committee are Bishop William Lawrence, representing the Society of Social Hygiene; Dr. Edward Reynolds, director of the American Society for the Control of Cancer; Dr. G. M. Kline, director of the Massachusetts Commission on Mental Diseases; Dr. V. Y. Bowditch, president of the Massachusetts Anti-Tuberculosis League, and Dr. Richard M. Smith, member of the Child Conservation Committee of the State Department of Health.

Professor Melville C. Whipple, instructor in Sanitary Chemistry, at Harvard University, will very soon enter the military service.

New Hampshire.—Dr. D. E. Sullivan, of Concord, member of the State Board of Health, has been commissioned a Captain and reported for duty at Camp Upton, Long Island, N. Y., on August 15.

Dr. George C. Wilkins of Manchester, member of State Board of Health, has been commissioned a Captain and expects to leave for stay at the Rockefeller Institute after which he will be ordered to Spartanburg.

A sanitary zone has been established around the Portsmouth Navy Yard, through the joint efforts of the U. S. Public Health Service, and the health authorities of Maine and New Hampshire to be known as the Portsmouth-Kittery Civil Sanitary District.

Rules and regulations have been formulated by the New Hampshire State Board of Health for the control of venereal diseases.

Dr. Charles A. Weaver of Manchester has been appointed officer in charge of venereal disease control to work in conjunction with the state board of health and the U. S. Public Health Service.

⁂

New York State.—The reinspection of all milk pasteurizing plants in the State of New York, outside of New York City is now being carried on by the New York State Department of Health, to determine if the proprietors have met the requirements of the department in the matter of equipment, operation and sanitation.

The demand for typhoid, paratyphoid vaccine has increased to such an extent that the laboratories of the New York State Department of Health have decided to distribute in addition to the present 1000 bottles of vaccine, special outfits for the immunization of one person. The concentration of pertussis vaccine has been increased from one thousand million killed bacilli to two thousand million.

Two venereal disease exhibits have been prepared and are being shown at the various county fairs in New York State during the months of August, September and October.

The June death-rate for New York State, as reported by the Vital Statistics Division was 12.0 per thousand population. This is not only the lowest June rate recorded in the history of the State, but also the lowest rate published in this State for any month in any year. The July rate carries the figure still lower—11.9.

The mortality reduction occurred quite uniformly throughout the State.

(*B. R. Rickards.*)

⁂

The Annual Conference of Health Officers was held in June. Among the speakers at the conference were Governor Whitman, Commissioner Biggs, Colonel Simon Flexner, Dr. Livingston Farrand and Dr. Rufus Cole.

⁂

By an Act of the Legislature, the shores of Lake George have been converted into one health district in charge of a full time health officer. Prior to the creation of the district, it was possible for one municipality to nullify to a large extent any attempt at improved sanitary conditions on the part of its neighbors.

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On May 22, the bacteriologists of the public health laboratories of the State met at a luncheon and renewed the New York State Association of Public Health Laboratories, formed last year. It was decided to meet each year in conjunction with the State Medical Society. (*D. G.*)

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Dr. George W. Goler, health officer of Rochester, N. Y., is in the Medical Corps, stationed at Camp Wadsworth, Spartanburg, S. C.

⁂

Investigation of Soda Water Fountains.—The New York City Department of Health has been requested by a representative of the Surgeon General of the U. S. Army, to investigate the possibilities of soldiers being infected through the use of soda water glasses, complaint having been received relative to the spread of infectious diseases through the use of a glass at the soda water fountain.

On July 25, the attention of Commissioner Copeland of the New York City Department of Health was requested through Major Smith, to make a special investigation of the possible sources of infection of soldiers through the use of soda water glasses improperly cleaned at the various fountains. Accordingly a detail was made to investigate this condition.

From July 25 to August 1 inclusive, there were 1,412 inspections made on soda water establishments, there having been found 226 violations, the offenders being summoned to Court for violating Section 144 of the Sanitary Code which requires the cleaning or sterilizing of glasses used by the public. One hundred and fifty-three of these have been held by the Court and disposed of as follows:

116 fined—fines varying from $1 to $6; total, $175.
10 had suspended sentences.
5 were dismissed.
95 cases still to be disposed of.

As is well known, the opportunities for contracting infection through the promiscuous use of glasses at these public places are probably only casual, yet the danger to the individual when such does occur is considerable, when it is considered that in the City of New York, diphtheria and various infections that may be disseminated through discharges from the mouth, make the necessity of carefully cleaning these glasses an urgent one.

The regulation of the Department of Health is sufficiently broad to enable the dispensers of soda water to do one of several things according to their choice, but they must assure the public the possibility to use a clean glass. Those who do not, naturally violate the regulation and subject themselves to the penalty.

Attention is called to the health bulletin of the Iowa State Board of Health, December, 1911, article by Drs. Albert and Boyd, relative to the different forms of infection discovered by their laboratory—page 37. Also article by Hans Zinsser, A. M. A., June 6, 1914, page 1802.

The coöperation of the New York press was timely, and the issuing of daily bulletins very materially aided in calling the attention of soda water dispensers to the request of the Army authorities.

⁂

Emergency Relief and First Aid Lecturers.—The Police Department of the City of New York, in order to anticipate any emergency that might arise through a hostile demonstration against this city, prepared a program of emergency relief, organizing committees of first aid, consisting of physicians, nurses and citizens in several districts of the city and arranged a system of training, should there be a call for the same, arrangements being made through the Fire Department to call by means of sirens—only the Fire Department of this city being allowed to use this particular whistle—the call being sounded for a ten minute interval.

In coöperation with this movement of the Police Department, the Department of Health, in league with the Municipal Civil Service Commission and other municipal departments, has established a course of lectures for the purpose of instructing municipal employees and others relative to emergency relief. The lectures are to be given by specialists in various subjects: a copy of proposed program is enclosed. The course is to be given, attendance registered, an examination held at the completion of the course, and a certificate issued.

This course of instruction on emergency relief should be very popular, particularly at this time when the services of both physicians and nurses are becoming so scarce.

1. Emergency war relief. (Introductory.)
   (a) Police, (b) Hospital, (c) Fire.
2. First aid in the home.
   (a) Danger of infection, (c) Emergent nursing, (d) Accidents.
3. Resuscitation.
   (a) Drowning, (b) Asphyxiation, (c) Relief.
4. First aid to infants.
5. First aid to the child.
6. Industrial injuries.
   (a) Frequency, (b) Prevention, (c) Aid.

These lectures will be given during the day at the noon hour in the Municipal Building and in the evening repeated in the Conference Hall of the Department of Health, preferably on Wednesday noon and Friday nights. There will be twelve lectures to the course and with a noon and evening hour, two opportunities are given to hear the same lecture.

The lectures are to be reprinted in some medical journal, reprints to be distributed or sold at a minimum cost to cover expense, and if the expense warrants it, and the course is sufficiently popular, to be made in book form and sold at a price to cover expenses.

(*S. Dana Hubbard.*)

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The New York City papers of August 13 announced that the charges brought against Mr. Lucius P. Brown, Director of the Bureau of Foods and Drugs, have been dismissed by the Board of Health. Mr. Brown will, therefore, be reinstated.

The announcement came as good news to sanitarians and many others.

North Carolina.—The State Board of Health succeeded in convicting eleven physicians in June, for violating the Quarantine Law. It points out that the rigid enforcement of quarantine laws has two objects in view: (1) protection of people against unneccessary contagion and (2) the protection of ethical, law-abiding physicians against mercenary, law-evading physicians. (*D. G.*)

⁂

Ohio.—The health commissioner of Dayton won a suit, in which the plaintiff asked $5000 damages, alleging that he had been unlawfully deprived of his liberty by the enforcement of quarantine regulations at his home. The jury rendered the verdict after fifteen minutes' consideration.

The State Department of Health has recently published three admirable bulletins on sex hygiene, entitled "Some Things a Young Man Should Know About Sex and Sex Diseases," "How Any Boy Can Develop His Health and Strength," and "Instructing Your Child in the Facts of Sex." (*D. G.*)

⁂

Akron Health Department Flourishes.—According to the Akron *Times* of August 16, the Public Health Department of Akron under the direction of Dr. C. T. Nesbitt, will be made a major department, independent of other city jurisdiction, if voters adopt the charter outlined by the commission at the November election.

The new department, if the charter is adopted, will consist of a health commission comprising two physicians and three laymen appointed by the chief administrator. The chief health officer, or director of health, will be named by the health commission.

In order that the health department may never again suffer from dearth of funds, the charter commission provided that council must appropriate annually for health work, a sum equivalent to not less than 50 cents for each inhabitant of the city, the number of inhabitants to be determined by the school census, upon a basis of five inhabitants to each registered child of school age.

The health department is one of the first departments under the new charter to receive the final sanction of the city charter makers who are rapidly completing their work.

The new council will consist of eight members elected at large for four-year terms. The mayor is to be elected independently and after election is to become the presiding officer of council with the right to vote on all councilmanic questions. One of the prime duties of the new council will be to select the chief administrator, who will have direct charge of the management of virtually all of the city departments.

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Death of Dr. J. H. Landis.—On August 23, Dr. J. H. Landis, health officer of Cincinnati, passed away. The cause of death was chronic kidney trouble.

Dr. Landis was born October 10, 1860, at Millville, Ohio, the son of Dr. Abraham H. and Mary Landis. Two of his three brothers have been elected Congressmen from Indiana and the third is Judge Kenesaw Mountain Landis, Federal Judge, who became famous when he found the Standard Oil Company guilty of rebating and imposed on the company a fine of $29,240,000.

As a student of Logansport (Ind.) High School, Dr. Landis was graduated in 1897 and obtained his degree of M. D. at the old Ohio Medical College in 1890. During the next year he served as an interne in the City Hospital and then began a general practice in the office of Dr. T. C. Bradford, Race, near Ninth street.

Dr. Landis served as professor of pathology in Presbyterian and Laura Memorial College from 1892 to 1895. In 1907 he was appointed professor of hygiene in the Medical Department of the University of Cincinnati.

In 1909, when the Board of Health was taken from the control of the Director of Public Service and reorganized, Dr. Landis was named a member of the board. January 1, 1910, he was appointed Health Officer for Cincinnati, the position which he was holding at the time of his death.

Dr. Landis was not only an expert on public health but he had the rare ability to surround himself with a corps of assistants, who were imbued with his energy and enthusiasm. The public health profession will join the friends of Dr. Landis in Cincinnati and Ohio in mourning his loss.

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Mr. N. A. Nelson, of the Cincinnati Anti-Tuberculosis League, has been granted an indefinite leave of absence to become a member of the Commission on Tuberculosis of the American Red Cross in Italy. He will leave for Italy some time during the month of September.

⁂

Wisconsin.—Dr. Gustav Windesheim, a leading practitioner, president of the Kenosha board of health, and president of the Wisconsin State Medical Society, has been chosen as health commissioner of Kenosha, Wis., and has given up his private practice to accept. He will continue as house physician at Willowbrook Sanatorium. Dr. Windesheim has been closely allied with big health movements of Kenosha and the state of Wisconsin for many years. He has already taken steps to obtain better health inspection of school children, and a new and stronger organization of school nurses.

Racine, Wis., has elected Dr. H. L. Wilson of Chicago as its physician-health officer. He has been connected with a tuberculosis sanatorium at Oak Forest, a suburb of Chicago. As a bacteriologist, he will be in a position to make laboratory tests required by an up-to-date health department.

The State Board of Health is coöperating with the city of Milwaukee in abating pollution of the Milwaukee river from industrial refuse, which has imparted a bad taste to the city's drinking water.

Whooping-cough held a strong grip on Milwaukee's juvenile population during July and August, with about 300 cases on record, Health officials have considered tagging of affected children to discourage others from contact.

The death-rate for Beloit during July was only 4.8 per thousand—far below the average, due in large measure, according to Health Commissioner W. L. Holt, to the baby clinics, visiting nurses and education of mothers in infant care through treatises issued by the health department.

Construction of Milwaukee's sewage disposal plant, involving expenditure of about $5,000,000 has been delayed until after the war. Meanwhile, all sewage will be treated with chlorine.

Practically all nurses in the employ of the Milwaukee health department have enlisted for Red Cross service. It is proposed to recall retired nurses to fill vacancies as far as possible.

The fourth biennial conference of health officers in Wisconsin drew a large enrollment on August 7 and 8 in Madison. Public health in war-time was the predominating theme. Major J. O. Cobb, M. D., of the U. S. Public Health Service, stationed at Chicago, spoke on "Venereal Disease," and Mrs. Dorothy Reed Mendenhall of the Children's Bureau discussed "Child Welfare in Wartime." Serums and vaccines, food conservation, school health supervision, public health nursing, sanitary engineering problems, and the garbage question were among the topics of importance.

The number of deaths in Wisconsin during the second quarter of 1917 totalled 7,485, an increase of 370 over the preceding period.

The State Board of Health has published two bulletins on venereal disease, one for young men and boys, the other for public officers, parents and educators. A third will be issued for young women and girls.

The public health exhibit of the State Board of Health, improved and enlarged, is being shown at county fairs and the Wisconsin state fair. Earlier displays were at the Wisconsin conference of health officers, the convention of supervising teachers, and the meeting of the Tri-State Medical Society, all at Madison.

Wisconsin physicians and midwives are being supplied with new packages of silver nitrate to replace solutions rendered defective through freezing in transit from the eastern manufacturers last winter.

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Volunteer Medical Service Corps.—The Volunteer Medical Service Corps was authorized by the Council of National Defense on January 31, 1918. Under this authorization, the membership of the corps consisted of all physicians who because of overage, physical disability, dependents and essential home needs were not eligible for service in the Medical Reserve Corps of the Army or Navy.

On August 5th, the Council of National Defense authorized a change in the scope of the organization and an increase and amplification of its Central Governing Board. Membership in the Corps as now authorized, makes eligible to the Corps every legally qualified physician, including women physicians, holding the degree of Doctor of Medicine from a legally chartered medical school, without reference to age or physical disability, provided he or she is not already commissioned in the Government Service. This organization has now the approval of the President.

GENERAL PLAN.

The Volunteer Medical Service Corps is exactly what its name indicates. It is a gentleman's agreement on the part of the civilian doctors in the United States, who have not yet been honored by commissions in the Army and Navy, and a representative board of governors consisting of officials of the Government associated with lay members of the profession, in which the civilian physician agrees to offer his services to the Government if required and asked to so do by the Governing Board.

It is a method of recording all physicians who are not yet in service, and classifying them so that their services when required, will be utilized in a manner to inflict as little hardship on the individual as possible. It is a method by which every physician not in uniform will be entitled to wear an insignia which will indicate his willingness to serve his Government.

As more than sixty per cent of the physicians of the country will be utilized in caring for the industries at home and the health of the home people, this large percentage of necessity will be expected to maintain their home status and continue their ordinary professional work.

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Mr. Jack J. Hinman, Jr., of the State Health Laboratories at Iowa City, Iowa, has been commissioned as First Lieutenant in the Sanitary Corps and has been ordered to the Army Medical School for duty.

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Dr. S. Van Es, of the North Dakota Agricultural College, has removed to the Department of Animal Pathology and Hygiene, University Farm, Lincoln, Nebr.

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Robert N. Hoyt, of the California State Board of Health, has been commissioned a first lieutenant in the Sanitary Corps, and is stationed at Fort Oglethorpe, Georgia.

⁂

Max J. Colton, Health Officer of Cumberland, Maryland, leaves that place on September 10 to accept a commission as lieutenant in the Sanitary Corps of the U. S. Army, and is to be stationed at Camp Greenleaf, Fort Oglethorpe, Georgia.

Mr. Frank S. Drown has been appointed State Registrar of Vital Statistics of Massachusetts. He was formerly expert in the U. S. Bureau of Labor Statistics.

⁂

Preventing Malaria Around Camp Bowie.—When the war broke out and cantonments and camps were built all over the United States, the Public Health Service immediately realized the danger that confronted the men from malaria, who would be stationed at the camps located in malarial districts. Immediately, work was begun in most of these places to prevent the spread of malaria among the troops. The work itself did not require the introduction of new methods, but rather the application of principles already confirmed many times. The anti-malarial work is noteworthy, however, for its extensiveness. At Camp Bowie, the procedure has been not only to drain swamps by building ditches, but to straighten channels where water is flowing so as to remove the pockets which permitted the formation of quiet pools. Furthermore, grass and weeds were cut, so as to destroy the resting places of the mosquito during the day time. In addition, certain places were oiled by spraying a mixture of two parts of crude oil with one part of coal oil. When the work is completed, fifty miles of river bank will have been cleaned, and fifty miles of ditches will be dug. Wherever possible fish are permitted to aid in the anti-mosquito work. Altogether seventy-five men are employed.—W. A. Hardenbergh, *Municipal Journal,* July 20, 1918. (*M. P. H.*)

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Immunization Against Diphtheria.—All infants below 12, and if possible below 18, months of age should be actively immunized with three doses, each 1.0 cc., of toxin-antitoxin. These infections should be given irrespective of the Schick test the infants may show at the time of immunization. All children over 18 months of age, as well as all youths and adults, should be tested with the Schick reaction first, and only those giving a positive reaction immunized with toxin-antitoxin. Three injections, each 1.0 cc. are given subcutaneously, one week apart. In infants below 18 months of age, the Schick test is not a necessary part of the immunization, since all the infants should be actively immunized. The toxin-antitoxin mixture should be prepared in a reliable laboratory and carefully tested for potency in the guinea-pig before it is sent out for use. The mixture should be slightly toxic and should represent 85 per cent of an L to each unit of antitoxin. This immunity has been found to last, now, over three years, and in a small group whom we had the opportunity of observing, over four years. These children will be retested further at yearly intervals, to determine whether any number lose their active immunity. So far this has not been the case.—Zingher, A., *Amer. Jour. Diseases of Children,* 1918, XVI, p. 83. (*D. G.*)

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General Instructions for Hay-Fever Subjects.—As the fall hay-fever season will commence about August 25, the American Hay-Fever-Prevention Association, in accordance with its annual custom, issues the following instructions in the interest of public health.

In the selection of homes, hay-fever subjects should choose localities distant from weed-infested areas. The pollen of the grasses, and of the summer hay-fever weeds generally, do not ordinarily travel very far, and a mile is usually a safe distance. The pollen of the rag-weeds and other fall hay-fever weeds, however, are very buoyant, and, in windy weather, may travel 3 to 5 miles.

During their attacks of hay-fever, patients should avoid localities infested with weeds generally, and especially those to whose pollen they are sensitive.

Should their neighborhood be infested with weeds, they should report these in the interest of public health, to the Board of Health.

During the hay-fever season, patients should avoid driving or riding into suburbs abounding in weeds. An attack resulting from this increased exposure may lower their resistance and make them more susceptible to the pollens in their own neighborhood.

A reasonable amount of exercise is beneficial, but this should be taken without increased exposure to the hay-fever pollens. Swimming, especially in salt water, is an excellent form of exercise.

DIET.

The diet of hay-fever subjects during the hay-fever season should be light as regards foods rich in protein, such as meat, fish, eggs, cheese and milk. Farinaceous food may be taken in moderation. Vegetables are of benefit and fruits.

High seasoning should be especially avoided, as it frequently reacts on the membranes of the nostrils, already irritated by the pollens. Alcoholic drinks are injurious.

In cases complicated by asthma, the rules regarding diet should be especially observed, and it is preferable in these cases to have the principal meal during the middle of the day.

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Correction.—In the August issue of the JOURNAL on page 572, in the article entitled "The Rat and Infantile Paralysis—a Theory," by Mark W. Richardson, M. D., Chart 6 was entitled "From Belgium British Plague Commission." This should have read "From *Belgaum* British Plague Commission."

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Courses in Public Health Nursing.—The National Association for Public Health Nursing has compiled a list of courses available in public health nursing. This is published in the August number of the Public Health Nurse. About fifteen courses are listed in the following states: Massachusetts, Connecticut, New York, Pennsylvania, Ohio, Illinois, Missouri, Virginia, and Wisconsin. Tuition varies; it is free at the New Haven Visiting Nurse Association and ranges as high as $125 in other institutions.

A list of summer courses is also given. The Association may be addressed at 156 Fifth Avenue, New York City.

*

Federal Social Hygiene Work.—The Social Hygiene Bulletin for July, 1918, gives details concerning the establishment of a Division of Venereal Diseases of the U. S. Public Health Service, in accordance with an appropriation of $200,000 for this purpose.

In charge of the Division is Colonel C. C. Pierce, Assistant Surgeon-General of the Service. A section for educational work and a section for medical school work are now being organized. The work of the Committee for Civilian Coöperation in Combating Venereal Diseases of the Council of National Defense has been transferred to the new Division.

In the following states arrangements have been made to place an officer of the Public Health Service in charge of the venereal disease bureau: Alabama, Arkansas, Colorado, Georgia, Indiana, Maryland, Massachusetts, Minnesota, Mississippi, Missouri, Montana, New Hampshire, Ohio, Oregon, Rhode Island, South Carolina, and Virginia.

North Carolina and Kansas have medical officers of the army as directors of the work for venereal disease control.

Colonel Pierce will be remembered for his work in Panama, as well as in California during the Panama-Pacific Exposition, when he had charge of the sanitation of the Exposition grounds. Last year he directed the campaign against typhus on the Mexican border. Within this new Division, organization is proceeding as rapidly as possible.

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Sanitarians and the New Draft.—The newspapers in August carried an order suspending voluntary enlistment, while plans for putting into effect the proposed draft law applying to ages ranging from eighteen to forty-five were being completed.

A subsequent announcement states that physicians may still apply for commissions.

An inquiry from the JOURNAL to the Surgeon-General of the Army brings the reply dated August 21, that the order of the Secretary of War suspending further voluntary enlistment applies to all non-technical branches of the Army. The order does not affect commissions in the Medical Corps, Dental Corps, or Veterinary Corps. It does apply to enlistments in the Enlisted Force of the Medical Department.

*

Venereal Disease Control.—The following standards for the discharge of venereal disease carriers are advocated by the United States Public Health Service. In order to be considered non-infectious as to syphilis, a patient should show by clinical examination, the absence of any area around the orifices of the respiratory, gastro-intestinal and genito-urinary tracts, from which infectious matter can be disseminated. The minimum requirements for a complete cure are (a) that after no treatment for one year, during which time there have been no symptoms, that no positive and several negative Wassermann reactions should be obtained. (b) A negative provocative Wassermann reaction. (c) A negative spinal fluid examination. (d) A complete negative physical examination, with special reference to the nervous and circulatory systems.

Before discharging cases as non-infectious as to gonorrhea, the following requirements must be met for men. (a) Freedom from discharge. (b) Clear urine; no shreds. (c) The pus obtained from the urethra by prostatic massage must be negative for gonococci on four successive examinations at intervals of one week. (d) After dilation of the urethra by passage of a full size sound, the resulting inflammatory discharge must be negative for gonococci.

In the case of females, the requirements are (a) no urethral or vaginal discharge. (b) Two successive negative examinations for gonococci of secretions of the urethra, vagina and the cervix, with an interval of 48 hours and repeated on four successive weeks.—*Public Health Reports*, June 19, 1918. (*M. P. H.*)

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Occupational Treatment of Tuberculosis.—Properly regulated work is highly beneficial to the sufferer from pulmonary tuberculosis, provided that the greatest care has been exercised in the selection of the work, and that the patient coöperates willingly. Even patients who are confined to bed seem to progress more rapidly, when allowed to fill out part of the day with some interesting finger work, instead of lying still and brooding over their lot. Contrary to expectations, relapses have been less than two per cent among the patients thus treated under the writer's care, and in a year there has been only one small hemorrhage following exposure to the workshop. A fourth word should be added to the code for the treatment of pulmonary tuberculosis, which would then read, rest, fresh air, good food and work.—Beyers, T. R., *Can. M. Ass. Jour.*, 1918, VIII, p. 1. (*D. G.*)

⁂

The Pennsylvania School for Social Service.—Courses in social service and in public health work for nurses are announced in the latest bulletin of the Pennsylvania School for Social Service. Of particular interest to sanitarians are courses on child welfare, recreation, public health and hygiene, rural health problems, housing and sanitation, medical social service, history and technique of anti-tuberculosis work, and principles and procedure of public health nursing. (*M. P. H.*)

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Illinois Tuberculosis Survey Plan.—A detailed outline for county tuberculosis surveys has been prepared by Dr. George T. Palmer and circulated by the Illinois association, of which he is president. The outline has eight divisions, as follows: I, Creating the Survey Organizations; II, Endorsement; III, Publicity; IV, Preparatory Work; V, Field Work; VI, Clinical Work; VII, Tabulation and Interpretation; VIII, Assistance in Making Surveys.

The State Department of Public Health maintains a Division of Surveys and Rural Hygiene, to which survey material may be submitted for final review before publication. Such material, so submitted, will also be passed upon by the Division of Tuberculosis, the Division of Vital Statistics and the Division of Communicable Diseases.

This outline will be a part of the county tuberculosis sanatorium campaign in each of the fifty Illinois counties, where the sanatorium proposition is to be voted on this Fall, and will be carried out by community nurses in thirty other counties during the present year. This will guarantee a simple type of survey in at least eighty of the one hundred and two counties of Illinois. In this work it is hoped to utilize the women registered with the Council of Defense for war-time service. (*D. G.*)

⁂

Necessity for Conserving Child Life.—Recently, the United States Supreme Court decided by five votes against four, that the National Child Labor Act was unconstitutional. In that decision, the safeguards which had been built up around the children were swept away. It was argued that the country is experiencing a labor shortage at present and that for patriotic reasons children should be employed. Furthermore child labor is cheap, and readily obtainable. In many cases, it was argued, that the earnings of the children are necessary in order to keep the family in comfortable circumstances, even though the father may be working. Apparently it is not realized that the employment of children tends to keep wages down, and helps to make it impossible for parents to support their families on their incomes. Nevertheless the President, Secretary of War and Secretary of Navy have all urged that the laws pertaining to child labor be rigidly enforced at this time, in order to conserve the health and welfare of the men and women of tomorrow. The States are urged to give this protection to the children to the utmost.—Women's Committee—Council of National Defense, *Department of Child Welfare.* (*M. P. H.*)

BOOKS AND REPORTS REVIEWED

Alcohol: Its Action on the Human Organism.
Longmans, New York, 1918. *Pp.* 133. *Price,* 60 *cents.*

This small book is authorized by a committee of nine British men of science of whom Cushny, Dale, Mott, and Sherrington are the best known in America. The eminence of the collaborators is a guarantee of the weight we may attach to their statements. This is probably the most dispassionate and conscientious treatment which the important subject has ever received, at least in a concise form. The tone maintained is cautious and conservative; the reservation of judgment respecting many questions is consistently recommended. On the other hand, explicit conclusions and the supporting evidence are offered whenever the facts warrant.

The style of the exposition is simple and popular yet there is no sacrifice of precision in the easy and colloquial writing. The depiction of the stages of drunkenness is the best since the twenty-third chapter of Proverbs. The general conclusions should satisfy all but the most impatient advocates of prohibition; very little is conceded to the opposition. It is noteworthy that in this book as in other recent literature of the matter no positive assertion is made as to a connection between the use of alcohol and early arterio-sclerosis.

Percy G. Stiles.

Sixth Annual Report of the International Association of Dairy and Milk Inspectors.

The report includes the papers read at the annual convention in Washington, D. C., held October 15–17, 1917, as well as the committee reports. The committee reports pertain to dairy farm inspection, to legislation and legal limits for the control of milk and cream, to diseases of man, methods of bacterial analysis of milk and milk products and the interpretation of results, bovine diseases, to rules and regulations necessary for securing a clean and safe milk supply, and finally to the care of milk in transportation. Very instructive papers were presented by Messrs. Ernest Kelly, Richard O. Webster, Hermann C. Lythgoe, R. A. Pearson, William H. Price, W. A. Evans, Joseph S. Neff, John J. Coughlin, Hoyes Lloyd, E. C. Schroeder, John R. Mohler and other representatives of this important field of food production. The material presented in the papers covers fully all phases of modern milk sanitation. The report forms a valuable addition to the literature and one that cannot fail to be an inspiration to sanitarians, dairy inspectors and bacteriologists. It was compiled by Ivan C. Weld, secretary-treasurer of the Association, 1120 Connecticut Avenue, Washington, D. C.

Arthur Lederer, M. D.

Standards of the Department of Health and Sanitation of the United States Shipping Board Emergency Fleet Corporation. *By Lieut.-Col. Philip S. Doane,* 1918.

The Department of Health and Sanitation of the United States Shipping Board Emergency Fleet Corporation was created with the purpose of performing the same functions toward the shipyard workers as a municipal department of health performs toward the citizens of a municipality. It was deemed highly desirable that standardized practice in the various parts of the country be obtained. It was with this in mind that this bulletin was prepared.

The desirability of frequent physical examinations is indicated. To provide proper treatment and care of employees a number of minimum requirements are outlined. Thus plants employing under one thousand men should have a first aid attendant or trained nurse for each shift and two doctors on call. In plants employing over one thousand men a resident physician should be employed. The first aid station is the unit recommended for plants employing up to one thousand men; for larger plants a dispensary is necessary. Plans for a first aid station and dispensary and the necessary equipment is outlined.

Concerning the problems of sanitation the author is cognizant of the fact that local conditions will determine the best procedure to follow and for this reason the Department of Health and Sanitation stands ready to furnish advice upon request as to best and most economical procedure to follow.

In regard to toilets at least one seat or water closet is recommended for each twenty-five workers. Urinals should be provided in a ratio of one for each forty workers.

Standards for the general design of restaurants and lunch-rooms are indicated, as well as for the care of foods.

An appendix contains an article prepared by Dr. Edward Martin on the "Technic of the Treatment of Infections and Infected Wounds with Dichloramine-T-Chlorcosane."

David Greenberg.

INDUSTRIAL HYGIENE AND OCCUPATIONAL DISEASE

Abstracted by Drs. E. R. Hayhurst, R. P. Albaugh and P. M. Holmes.

Present Status of our Knowledge of Fatigue Products.—Scott summarizes his paper as follows:

1. Substances carrying hydrogen ions, as lactic, beta-oxybutyric acids, potassium, dihydrogen phosphate and carbon dioxide, stand as causal agents of fatigue.

2. Certain products of protein disintegration, as indol, skatol and phenol may produce fatigue symptoms, and may be active agents in producing normal fatigue.

3. There is some evidence that the negative ion of lactic and beta-oxybutyric acids and that certain positive ions, especially that of potassium, are capable of producing certain fatigue phenomena.

4. There is no evidence that the negative ions of carbonic, phosphoric or sulphuric acids are fatigue substances.

5. There is no evidence at present for the existence of specific fatigue substances as proposed by Weichardt.

6. There is very little probability that certain or creatinine have any relation to fatigue or to muscle work in general.

7. There are no doubt numerous bodies, as purine bases, uric acid, etc., which may be increased by work, but which have no causal bearing on fatigue.—Ernest L. Scott, *Public Health Reports*, Reprint No. 465, U. S. P. H. Service, Washington, D. C.

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Women Munition Workers in France.—The fact that before the War began, French women took a large part in the business side of family life, in contradistinction to the English women, explains the rarity of discussions and reports concerning women's activities in munitions employments in France. In France private employers still control a large part of this industry, whereas in Great Britain the English Government still maintains general control and oversight of the munitions industries. It is difficult to get precise data as to the number of women employed in munition work in France, owing partly, perhaps, to their being scattered through small shops. While in 1914 there was a temporary lull in these industries, in the latter part of 1915 the demand for workers outstripped the supply, and laborers were brought in from French colonies and from foreign countries. Gradually the French Government encouraged the employment of women to take the place of men, so that by the end of the year 1916 all women readily obtainable were at work. Sweeping relaxations in regard to hours of work led to some abuses which have since been gradually corrected. Finally, in the middle of the year 1917, the Minister of Armaments issued a circular proclaiming one day of rest weekly for all women working in state munition factories, and setting the limit of a day's work at ten hours, broken by one or several periods of rest, amounting to at least one hour. Restrictions as to night work for girls under eighteen were instituted on June 29, 1916. About this same time welfare work features were extended covering housing, the care of babies whose mothers were at work, the proper care of expectant mothers, and of each mother and baby during the first year of the latter's life and the establishment of crèches and day nurseries to all hostels erected for employees. The French have not, as the British have, established training courses and factories in which women are prepared to take up skilled work. The intense production necessary has led to the installation of automatic machinery and subdivision of labor, two conditions which are usually favorable to a good production on the part of women.—Mary Conyngton, *Monthly Labor Review, U. S. B. of L. S.*, July, 1918, pp. 116–129.

⁂

Injurious Substitutes for Turpentine in the Painting Trade.—The substitution of turpentine by various substances is practised to a large extent in this country, and inasmuch as most of these hydrocarbons are productive of severe symptoms and even death when used in closed quarters, the regulations adopted in various parts of Germany, where it has been impossible to obtain turpentine for over two years, are worth noting. These have been gotten together by the *Bureau of Labor Statistics*, and published in its July, 1918, number, pp. 185–190. The principal features, as laid down for the painting of closed rooms in ships, are an effective ventilator to draw in air from the open, the relief of workmen after each half-hour's work, with permission to return to this work only after the lapse of another half-hour, the work to be done only at night or during the early morning hours in the hot season, the employment of a reliable supervisor of the workmen, the informing of workmen that certain paints and mixtures may become injurious and even cause death, and the placing of warning signs in front of freshly painted rooms prohibiting the performance of other work in them until the vapors have disappeared. Furthermore, facilities for washing should be provided and used, smoking and the drinking of alcoholic beverages prohibited, oxygen immediately administered in cases of severe poisonings, all containers should be kept tightly closed with a warning notice and male workers under 18 years of age and all female workers prohibited from working with quick-drying paints Workmen themselves, however, must use greatest possible care to escape injury. "All paint manufactured with low-boiling-point, distilled products of petroleum, light coal tar, turpentine, carbon bisulphide, or similar substances, shall be considered as injurious to health."

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The Problem of the Married Women in Industry.—Mrs. Florence Kelly's statements, upon the subject indicated in the title include the following: 1. That married women should not be considered as a unified mass of workers. When children are grown if a woman has strength and leisure, there is no good reason why she should not engage in industry. 2. That wherever mothers of young children are earning their living, or a share of their living, they are competing with their husbands and wages are always down and the death-rate of the little children mounts. 3. Under the head of sickness insurance, no special insurance provision for mothers of young children who are at work in industry should be advocated as too often advantage would be taken of this fact, and husbands send their wives into the factory for the sake of this cash bonus. Many Italians in the North and many American-born men in the southern mill villages are eager to retire at thirty to thirty-five years of age, and allow their wives and children to support them thereafter. If we are going to insure mothers, let us include the wives of all workingmen and not just mothers going into industry. The Secretary of War by a [illegible] of the pen has stopped sweatshop work [illegible]ufacture of uniforms. All cont[illegible] production for the Government co[illegible] to do precisely the same thing by t[illegible]trative method.—*Bull., Penna. Dept. of* [illegible] *and Industry*, Vol. V, No. 1, pp. 55–60, Series [illegible] 1918.

PUBLIC HEALTH LABORATORY NOTES

Abstracted by Arthur Lederer, M. D.

The Preservation of Typhoid and Paratyphoid Bacilli in Stools by Emulsifying in Glycerine.—The author confirms an observation of Teague and Clurman (*Jour. Inf. Dis.* 1916, p. 653), that by emulsifying infected stools in 30 per cent glycerine, B. typhosus can be kept living and can be isolated for a longer period than is possible with an emulsion made with normal saline solution. The author extended this observation and found it to hold also for B. paratyphosus A and B. When specimens of feces sent to be examined for enteric organisms are liable to be delayed in transit, it is better that they should be first emulsified in 30 per cent glycerine. This is especially the case in warm weather and in hot countries.—T. H. C. Benians, *Lancet* (*London*) 194, 255 (1918); *Rev. Bact.* 8, 5 (1918).

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The Classification of Hemolytic Streptococci.—The strains of streptococci which form the basis of this study, while limited in number to twenty-eight, can be said to represent fairly the hemolytic variety. The strains were derived from the pathological processes usually associated with infection by this variety of streptococcus. The hemolytic variety of streptococcus is homogeneous, consisting of members that are nearly identical. This homogeneity is most strikingly displayed in the behaviour of these streptococci in the complement fixation reaction, all the strains studied reacting in a nearly identical way with all the antisera.—Ralph A. Kinsella and Homer F. Swift, *Jour. Exp. Med.* 28, 169 (1918).

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Antiseptic Value of Some Essential Oils.—Forty-five essential oils were examined in regard to the limit dose (in parts per 1000) necessary to be added to gelatine bouillon, to prevent all microbic vegetation, even after 7 months, when the plates were inoculated with a sewage effluent containing 9 to 10 million germs per cc. The amounts required varied from 0.7 parts per 1000 in the case of thyme oil, to over 15 parts per 1000 in the case of patchouli oil, the value, under similar conditions, for phenol being 5 to 6 parts per 1000.—L. Cavel, *Compt. rend.* 166, 827 (1918); *Jour. Soc. Chem. Ind.* 37, 388 A. (1918).

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Cobra Venom Reaction in Diagnosis of Cancer.—Farmachidis' new series of tests sustain his previous assertions, that the activation by cobra venom of the hemolytic action of the serum in the deviation of complement test occurs only with serum from persons with malignant disease. With rabbit red corpuscles, a positive reaction was pronounced in his total of 53 out of 64 persons with carcinoma. In all the other 11 cases, the reaction occurred, but not until after the twentieth hour (between the twentieth and the thirty-fifth hours), and consequently he lists these responses as negative. In sixty-two persons with tumors of genign character, fibromas, cystomas, etc., there was no trace of a positive reaction. He now uses 0.10 cc. of a 1 per twenty thousand solution of the cobra venom, that is, one part of a 1 per five thousand solution of cobra venom in three parts physiologic saline. In his previous research, he used always the 1 per five thousand solution of the cobra venom, but found that this alone sometimes hemolyzed guinea-pig red corpuscles, and now he uses one fourth of this strength. His conclusions are all in favor of the value of the cobra venom reaction as an aid in the diagnosis of malignant disease.—C. B. Farmachidis, *Riforma Medica, Naples,* 34, 382 (1918); *Jour. Am. Med. Assoc.* 71, 320 (1918).

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Preparation of U. S. Army Triple Typhoid Vaccine.—This vaccine contains 5 strains of typhoid and paratyphoid bacilli. Of the former only the Rawlings strain, of the latter four; Rogers and Meers Para "A" and Cools and Rowlands Para "B." The Meers and Rowlands strains were secured from England and are the strains used in the English vaccine. The description of the preparation of typhoid and triple typhoid vaccine is given with considerable detail.—Major C. G. Snow, *Bull. Johns Hopkins Hospital,* 29, 157 (1918).

Normal Beef Serum in Treatment of Anthrax.—Two hundred cases of Anthrax were treated with ordinary beef serum without other measures, the malignant pustule and septicemia subsiding under it, even more promptly than when anti-anthrax prepared serum is used. Before this serotherapy was instituted, the mortality had been 10 per cent while with the beef serum the mortality was only 0.5 per cent in 200 cases. Similar good results have been reported from Monteviedo in 18 cases, the outcome a greater success than with any other treatment known to date. The serum is injected subcutaneously in doses of 30 to 50 cc., and this is repeated in 12, 24 or 36 hours as the case may require. In very severe cases the serum can be given by the vein. The serum is sterilized by heating it twice for one half hour at 56 C. Anaphylaxis is even more exceptional with beef serum than with horse serum.—J. Penna, J. B. Cuenca and R. Kraus, *Prensa Medica, Argentina* 4, 455 (1918); *Jour. Am. Med. Assoc.* 71, 234 (1918).

* * *

Potency of Antimeningococcic Serum.—A number of methods of testing antimeningococci serum have been employed but none has won general acceptance. Thus American manufacturers have been accustomed to use the complement fixation method, the agglutination method, the determination of the opsonins or bacteriotropins, or the animal protection test. Unfortunately there is no satisfactory evidence as to the correlation of the results of any of these methods of testing with the results of the therapeutic application of the serum to the disease in man. It was felt that it would be wise to accept as suitable for therapeutic purposes any serum which passed satisfactorily either by an agglutination or a complement fixation test. It was decided that the tests should be made with one or more representative organisms of American origin of each of four groups determined by agglutinin absorption methods. There have been examined at the U. S. Hygienic Laboratory since Dec. 1, 1917, 101 lots of serum. Of these, 25 failed to meet the requirements. All American serums now on the market are polyvalent serums. It has been determined that producers can obtain results comparable with those of the Hygienic Laboratory, when using the methods of testing specified by this institution. By the tests, thus far devised, it is possible only to determine definitely that the serum examined is derived from a horse, which has been immunized with strains of meningococci representative of the various serologic groups occurring in this country. All meningococci serums now offered for sale in interstate traffic are required to show this property before release from the plant of the manufacturer.—G. W. McCoy, N. E. Wayson, Hugh R. Corbitt, *Jour. Am. Med. Assoc.* 71, 246 (1918).

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A New Method of Preparing Gonococcus Antigen.—An antigen prepared by dissolving the gonococcus in alkali, and then rendered neutral proved to be superior to the ordinary gonococcus vaccine. The method of preparation is given in detail.—D. Thomson, *Lancet* (*London*) No. 4950,42 (1918).

* * *

The Loss of Complementing Power in Kept Serum.—A satisfactory method of estimating decreases in the complementing powers of sera over considerable periods of time has been devised. While kept normal, guinea-pig serum loses its complementing power more rapidly in the early stages than the later, and at 20 C. than at 9 C., yet retains its activity for a considerably longer time than has generally been conceded.—J. S. Douglas and J. W. Bigger, *Lancet* (*London*), *No.* 4950.44 (1918).

* * *

Micro, and Macro-Methods of Cultivating Anærobic Organisms.—The following apparatus and methods are described:

1. Apparatus for removing oxy
sels containing anærobic cultures.

2. A micro-method for studying the
of anærobic organisms.

3. Methods of growing anurobic organisms
simple test tubes.

4. Methods suitable when more than 1 test tube at a time is to be incubated.

5. Method of growing anærobic organisms on a larger scale in a single vessel.—J. Holker, *Jour. Path. and Bact.* 22, 28 (1918).

* * *

Simple Method of Collectiug Blood for the Wassermann Reaction.—The method is recommended especially for neurasthenic patients.

The thumb or the lobe of the ear is pricked and specimens of blood are taken with filter paper. The size of the blood stain should be that of approximately a sixpenny piece. Each strain will contain roughly 0.08 cc. blood or 0.04 cc. serum. The number of such prepared papers sufficient for the test depends on the number of tubes to be used for each case. As a rule six is the maximum. No further treatment is required beyond allowing the papers to dry over night or in the incubator for a shorter period. For use they are folded and either before or after the other reagents have been added, one, representing one dose, is dropped into each tube, which must finally contain sufficient fluid to completely cover the paper. The tubes are shaken or inverted. Further steps are the same as when fluid serum is used. The films should be used within a week of collection.—Chung Yik Wang, *Jour. Path. and Bact.* 22, 28 (1918).

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New and Simple Ultra-Filters.—Ultra-filters of simple construction for the filtration of colloidal solutions are described. It has been found that an efficient apparatus may be obtained by the use of either an ordinary or a Buchner funnel, and filter paper which has been treated in situ with a 2 per cent collodion solution. The results obtained by subjecting a number of colloidal solutions of different kinds to ultra-filtration are described.—W. Ostwald, *Kolloid Ztsch.* 22, 72 (1918); *Jour. Chem. Soc.* (*British*) 113, 192 (1918).

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Method for Staining the Diphtheria Bacillus.—The following method of staining has given very satisfactory results:

Stain I.

Gentian violet (sat. alcoh. sol.)	10 cc.
Acetic acid sol. 4⅓ per cent	90 cc.

Stain II.

Bismark brown	0.480 mg.
Distilled water	125 cc.

The body of the bacillus becomes a delicate shade of purple or brown, and the clubbed ends and polar bodies, dark purple or black.—Foster A. Beck, *Jour. Am. Med. Assoc.* 71, 109 (1918).

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Examination of Sputum for Albumin in Tuberculosis and Bronchitis.—Altogether 580 tests were made. To 5 cc. of sputum, add 20 cc. of normal saline and 5 or 6 drops of acetic acid. Shake thoroughly and filter. Test the filtrate by boiling or with nitric acid for albumin. In 57 cases of chronic bronchitis the albumin test was invariably negative. In 73 cases of suspected tuberculosis without definite signs, about 87 per cent gave a positive reaction, and probably 60 per cent of these showed organisms within 2 or 3 months. In 71 cases of clinical tuberculosis 79 per cent showed albumin, if the sputum was taken during an elevation of temperature, but albumin was nearly always absent from sputum when the temperature and pulse were normal or subnormal. Choose a febrile period for taking the sputum, as albumin will be present then if ever.—B. S. Cornell, *Bull. Canadian Army Med. Corps*, 1, 45 (1918); *Jour. Am. Med. Assoc.* 71, 408 (1918).

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"Hormone" Medium as a Substitute for Serum Medium.—The investigations of many workers have long been directed toward the production of media that would answer the growth requirements of delicate organisms without the necessity of employing serum fluids. The part played by the so-called vitamins or hormones in the artificial media in the reproduction of bacteria has been made a deep study in the last few years. For agar the following method was finally developed.

Chopped beef heart or steak	500 gm.
Water	1000 gm.
Peptone (Bacto)	10 gm.
Agar (Bacto)	16 gm.
Salt	5 gm.
Whole Egg	1 gm.

The product prepared has a growth value 10 times as great as standard agar and is at least as good as the average grade serum agar. Directions are also given for the preparation of Hormone Gelatin Broth and Semisolid Agar.—F. M. Huntoon, *Jour. Inf. Dis.* 23, 169 (1918).

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The Influence of Incubation on the Wassermann Reaction.—Complement binding is better in the incubator at a temperature of 37 C. than in the open water bath at the same temperature. It takes place gradually, many hours being required for its completion. It proceeds much better at a temperature of 10 C. than at 37 C. or 21 C.—E. H. Ruediger, *Jour. Inf. Dis.* 23, 173 (1918).

Method of Isolating B. Botulinus.—The authors succeded in establishing the diagnosis in seven cases, by the isolation of B. botulinus from materials that were collected for examination. The culture media employed were glucose-infusion agar, glucose-infusion broth and sheep's brain medium. Immediately before the media are inoculated, they should be boiled for at least twenty minutes. After boiling they should be cooled at once. The odor of B. botulinus cultures is quite characteristic, somewhat like rancid butter or certain kinds of cheese. The glucose broth cultures are allowed to incubate for about one month before they are disturbed. A portion of the broth is then passed through a diatomaceous filter and 1 cc. is injected subcutaneously into a guinea-pig. The organism could always have been obtained in pure culture from the broth in which a virulent toxin had developed.—E. C. Dickson and G. E. Burke, *Jour. Am. Med. Assoc.* 71, 518 (1918).

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Intrarectal Administration of Arsphenamin.—The intrarectal administration of arsphenamin has been found to be a successful method of treating syphilis and relapsing fever. The untoward effects are practically eliminated by slower absorption. The method requires no special skill in administration, and can be intrusted to a nurse or to the patient himself. The dosage can be increased by this route and given as often as every three days. It is the method of choice in nervous subjects, in obese or very anæmic women, and in children. It is believed that it offers the same curative value as the intravenous route.—A. S. Boyd and M. Joseph, *Jour. Am. Med. Assoc.* 71, 521 (1918).

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Comparison of Wassermann and Bruck Reactions.—The Bruck serochemical reaction for syphilis (serum and nitric acid) is unreliable as a test to supplant the Wassermann reaction in the tuberculosis sanatorium. As far as could be noted from the above observations it gives no data of value.—Corper, H. J. and Fiala, L.—*Amer. Rev. of Tuberculosis*, 1918, II, p. 290. (*D. G.*)

⁂

Tuberculosis and the Wassermann Reaction.—As a result of the routine, serological blood examination of the 1,395 men and 1,399 women residents of the City of Chicago Municipal Tuberculosis Sanatorium, a definite positive Wassermann reaction was obtained in 7.2 per cent of the men and 5.8 per cent of the women.—Corper, H. J., *Amer. Rev. of Tuberculosis*, 1918, II, p. 290. (*D. G.*)

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Medium for the Influenza Bacillus.—Quantities of 0.25 c. cm. of Allen and Hanburys trypsin compound are added to tubes containing 4.75 c. cm. of sterile broth. The mixture is then incubated for 24 hours and any contaminated tubes discarded. One c. cm. of blood from a venipuncture is then introduced into each tube, and the mixture of trypsin-blood broth is incubated for three or four days. The product is then ready for use and is mixed with agar, as if making ordinary blood agar, in the proportion of 5 c. cm. of trypsin-blood mixture to about 30 c. cm. of agar. The trypsinized blood can be used in larger proportions than indicated, with advantage, if large quantities of emulsion be required. The agar used is preferably Douglas's trypagar and should be faintly but definitely alkaline to litmus paper. The medium grows influenza freely from the first culture and it is to a marked extent selective. (*D. G.*)

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Medium for Cultivation of Meningococcus.—To fluid nutrient agar cooled to 50° C. add 3 per cent of sterile laked-blood mixture prepared by following procedure:

A wide mouthed sterile bottle with volume graduation marks has added to it 10 g. of sodium citrate dissolved in 10 c. cm. of water and is taken to slaughter house. When a sheep is being slaughtered, the blood after the first g[illegible] is received into bottle usually up to 1 litr[illegible] during process bottle is vigorously sh[illegible] arrival at laboratory 1.25 c. cm. of forn[illegible] added to litre of blood and thorough adm[illegible] ensured. The blood is then transferred w[illegible] aseptic precautions to a ground glass stoppered bottle and 30 c. cm. of methylated either are added to one litre of blood. Stopper firmly inserted and bottle shaken; then left overnight in incubator at 37° C. When required 3 c. cm. of mixture are added by pipette to fluid agar at temperature of about 50° C. It is convenient to have agar stored in flasks of 100 to 200 c. cm.—Darling G. and Wilson, W. J., *Lancet*, 1918, CXCV, p. 105. (*D. G.*)

THE USE OF CONVALESCENT HUMAN SERUM IN INFLUENZA PNEUMONIA—A PRELIMINARY REPORT.*

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and
W. R. Redden,
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We are all aware of the high degree of fatality resulting from the pneumonia following the influenza of the present epidemic. All of our deaths have been due to the pneumonia complication and none to the influenza as such. Here at the Naval Hospital, the percentage in the first groups reached as high as 50 to 60, and more recently the mortality has dropped to 30 per cent. No doubt this complication will continue to give a high mortality rate, especially when the disease invades new territory. For this reason, the authors have decided to make public their results in the treatment of a small group of cases, by the use of serum from patients convalescing from pneumonia, following an attack of influenza. It will be readily seen that a complete report at this time is out of the question, but we hope to present sufficient data to indicate the possibility in the use of convalescent serum so that further work can be carried on in territory where the disease is now active, and where proper equipment is at hand to carry out the necessary laboratory details.

The observation and treatment, by the writers, of over four hundred cases of influenza pneumonia in this hospital has afforded opportunity to compare the various methods of treatment with a fair degree of accuracy.

The use of serum from convalescent influenza pneumonia patients was suggested by the junior writer as possibly having curative value, because of probable antibody content. The reason for this was the experimental evidence presented by Flexner and Lewis,† with convalescent serum from poliomyelitis patients, and later the clinical evidence presented by Amoss and Chesney,‡ during the poliomyelitis epidemic in 1916.

The serum was first tried on two patients with a very severe and extensive broncho-pneumonia—an officer and a nurse. The officer developed influenza September 23. On the 26th he had some evidence of a beginning broncho-pneumonia. His temperature was 103; some elevation of pulse and respiration. On the 28th, he was desperately sick; temperature 104.4°; respiration 36; pulse 104; he had considerable nausea and vomiting, looked toxic and had beginning cyanosis and vaso-motor disturbances; also a profuse sanguino-purulent expectoration; 100 cc. of serum was given at 1.30 p. m. Another 100 cc. at 8 p. m. The next morning, the 29th, patient was distinctly improved; less nausea, cough and expectoration; temperature 102; respiration 40; pulse 104; 75 cc. of serum given at 11.30 a. m. On the 30th, a decided improvement noted; 8 a. m. temperature 100.8°; respiration 30; pulse 88; 75 cc. serum given; temperature normal at 4 p. m. Patient in excellent condition,

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*This article is reprinted from the *Journal A. M. A.*, to whom the thanks of this Journal are due.

† Flexner & Lewis showed definite exp. results in monkeys. Jour. Amer. Med. Assoc. 1910, Liv. 1780.

‡ Amoss & Chesney, Jour. Exper. Med. 1917, XXV, 581, and others.

stating that he felt well; after which he made an uneventful recovery. Laboratory report of sputum injected in peritoneum of mouse showed influenza bacilli and type IV pneumococcus.

The nurse took sick with influenza on September 24th. On the 27th, running a continuous temperature of 103; respiration 36; pulse 104. On the 29th, temperature reached 104; respiration and pulse same. Areas of broncho-pneumonia present, especially in the right middle lobe. Patient very toxic, unable to keep anything on her stomach for three days. Water given per rectum. Marked cough and muco-purulent expectoration present. At 11 a. m., the 29th, 100 cc. serum was given. On the morning of the 30th, patient ate some breakfast and was much improved, although very sick; vomiting practically stopped. Temperature 103; pulse 114; respiration 22; 75 cc. of serum given. October 1st, temperature normal; all symptoms subsided and she made an uneventful recovery. See clinical charts.

Up to the present time, thirty-seven cases in all have been treated with serum. This represents all the pneumonia patients who have been admitted since October 1st, except the officer and nurse previously mentioned. Of this group, thirty are convalescent; six are under treatment; one dead. Of the six under treatment, two are much improved; two have received only one injection of serum; two cases not improved, one of whom is critically ill. Of the thirty convalescents, eight received treatment on the second day of the pneumonia; fifteen on the third day; four on the fourth day; three on the sixth day. Of the six under treatment, three received serum on the second day; two on the third day, and one on the fourth day. The fatal case received the first serum on the fifth day.

SERUM TREATMENT

Convalescent patients were bled as soon as convalescence was well established, the majority within a week or ten days of a drop to normal temperature. The serum was given as early as the diagnosis of the pneumonia complication could be made, so there has been no doubt about the lung involvement. The dose of serum has varied from 75 cc. to 125 cc. intravenously and the interval between doses has varied from eight to sixteen hours. Treatment was continued until there was no doubt about the recovery of the patient. The majority received about 300 cc. Three received only 100 cc. and two received from 600 to 700 cc. It was found, as we anticipated, that there was a marked difference in the potency of the convalescent serum. At least ten out of seventy sera had no effect on patients. Under these conditions, the succeeding doses of serum were from other patients. Results from this serum are usually obtained in the first twenty-four hours after its use. If no results are obtained this time, the serum from another donor should be used. An attempt was made to judge the potency of the serum by the amount of lung involvement. This was done by obtaining careful statement of the physical findings and the clinical course of the disease in the donors.

PROCEDURE

Wassermann tests were made on all donors as soon as possible in order not to waste time on bleeding those who showed a positive reaction.

Compatibility tests of donors' serum, with recipients' corpuscles, was made as soon as new cases appeared on the ward. Then usually ten to fifteen sera were tested against the corpuscles of each recipient in order to have plenty of available serum for complete treatment.

Blood to the amount of about 800 cc. was taken from each donor, under sterile precautions; 400 cc. at a time on two successive days. Thus each donor yielded about 300 cc. of serum. The blood was allowed to clot at room temperature for about an hour, then plate cultures were made, and the containers placed on ice over night. The separated serum was cleared by centrifugalizing at high speed; then bottled, and in most cases given the same day. Trikresol (0.30 per cent) was used only in serum kept over twenty-four hours. It is interesting to note that only four patients had chills after the serum injections. All of these received serum containing trikresol, while three others receiving trikresolized serum gave no such reaction. At no time has a donor been inconvenienced by the withdrawal of the above amount of blood. In fact, the majority wanted to give more.

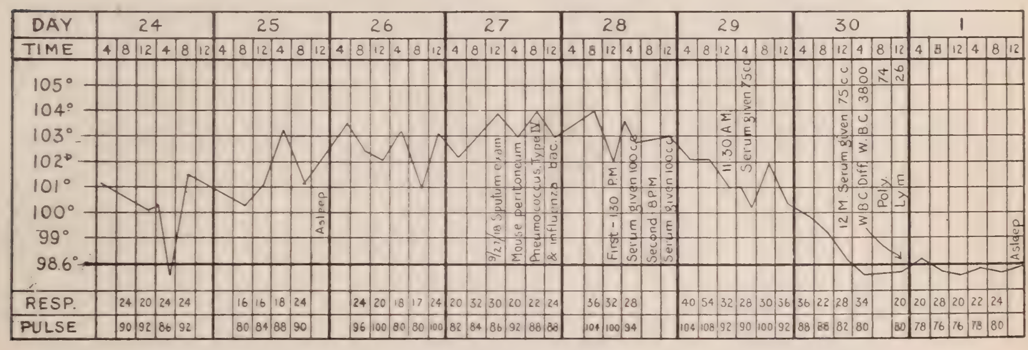

FIG. 1. Temperature Chart of Officer.

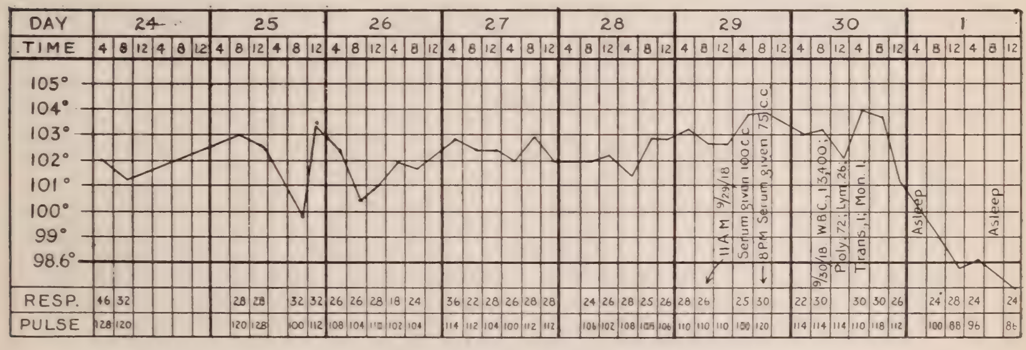

FIG. 2. Temperature Chart of Nurse.

An attempt has been persistently made to test the potency of the serum of the donors by complement fixation and by gross agglutination, using the recently isolated influenza bacillus as an antigen, but as yet we have found no method of testing the antibody content of serum except by its clinical action on recipients.

CONCLUSIONS

Treatment of influenza patients with the pneumonia complication by the use of convalescent serum was started at this hospital September 28, 1918.

Up to the time of writing, thirty-seven pneumonia cases have been treated. Of this group, thirty are convalescent; six are under treatment; one has died; all but one of these have a favorable outlook.

At present, the potency of the convalescent serum can be tested only by its clinical effect. Further attempts are being made to titre the serum.

Experience shows that the most beneficial results will be obtained by giving the proper serum within the first forty-eight hours of the penumonia complication.

It has been our observation that the virulence of the organism has decreased in this hospital as the epidemic progressed, but, making allowance for this diminution in severity of the pneumonia cases, it is believed that the serum from convalescent influenza pneumonia patients has a decided influence in shortening the course of the disease and in lowering the mortality.

This treatment requires the coöperation of a well-equipped laboratory, where the proper laboratory procedure, as previously noted, can be performed; and should be used only by those who are prepared to have this necessary laboratory work carried out.

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CENTRALIZED HEALTH AND RELIEF AGENCIES IN AN INFLUENZA EPIDEMIC.

Eugene R. Kelley, M. D.,
State Commissioner of Health,
and
B. W. Carey, M. D.,
Epidemiologist, State Department of Health, Boston, Mass.

THE earliest and most striking feature that came to our attention in planning our campaign for combating the pandemic of influenza, which has ravaged this state for the past month, was the absence of uniform methods of organization in the various health agencies upon whom we were obliged to rely. It was perfectly apparent that everyone was anxious to help, each willing to work unceasingly till the appointed task had been accomplished, but there was likewise evidence that each wanted to go along in their own accustomed groove, not realizing that at such a time unification of effort and direction could only be obtained by the loss of their personal identity.

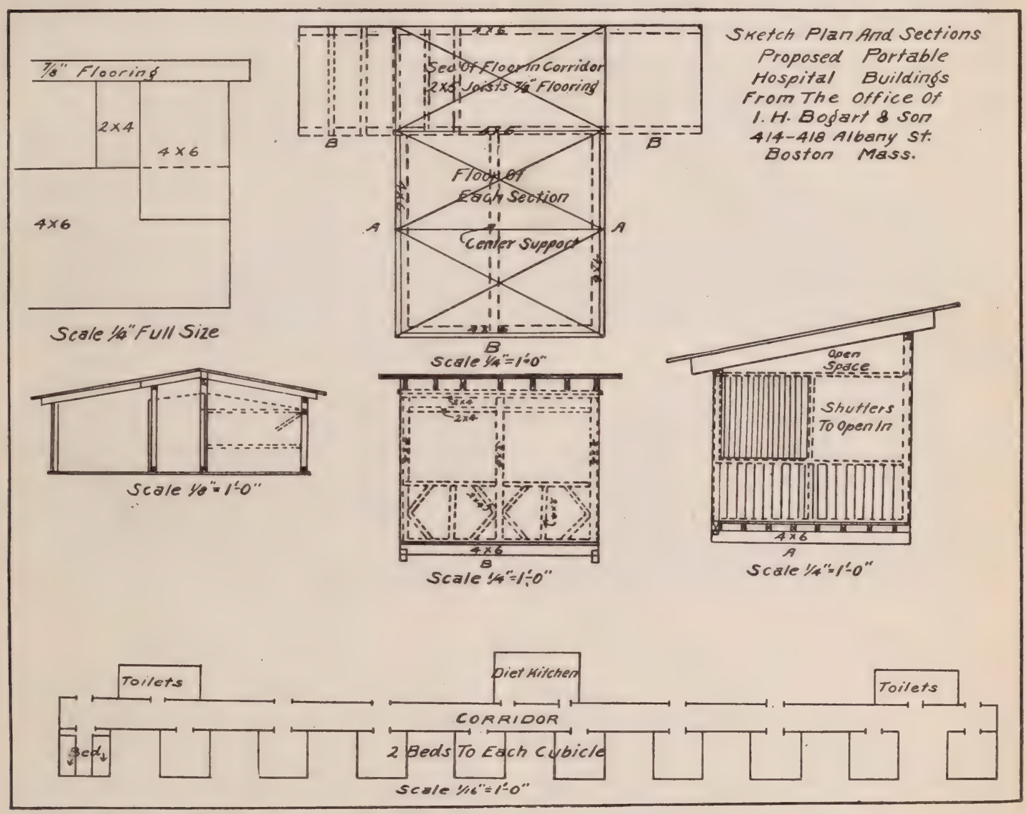
A short time sufficed to prove to us that unless we were to be buried under a multiplicity of agencies, and to court disaster, we must coördinate these forces under one administrative head to work for the common good of all. As calls for assistance coming to this department became more urgent, organizers were sent out by Miss Bernice W. Billings, who had immediate charge of the nursing forces, to investigate conditions in each city or town, ascertaining if possible if all local health agencies were giving maximum service to the locality in which they were situated.

In many instances, it was clearly shown that if these local bodies would consent to centralization and coördination, they would be fully able to handle their own problem.

The law directs specifically that each local board of health shall make such regulations as it deems necessary for the control of communicable diseases within its limits, and here, already established, was a logical administrative head under which all activities for checking this outbreak were to be placed.

After several organizing visits had been made to various places, it was deemed advisable to formulate a plan for distribution to local boards of health, and to other agencies, who were helping in the actual combating of this outbreak, or where it was evident that they would be called upon within a very short time to organize for their own protection.

The work of formulating this plan was allotted to Miss Amy Wood, general secretary for the League for Preventive Work, who early volunteered to assist in our work.



A brief summary of her plan is as follows:

Work must be centralized in permanent, or temporary, office of the boards of health.

This office to be kept open at all times with responsible person in attendance whose duty it shall be

(a) To receive all general calls for medical service, and to assign to doctors.

(b) To arrange for admission to emergency hospitals on call of doctor, and provide for ambulance service.

(c) To have assignment of cases ready promptly for visiting nurses and aids to start out at 8.30 a. m. and 1 p. m.

(d) To arrange for proper and continuous nourishment for patient, or for families, reported by doctors, or nurses, as in need.

(e) To receive reports from nurses.

(f) To receive daily reports from doctors of number of new cases, and deaths.

(g) To arrange for the proper care of the dead within twelve hours.

All doctors should be requested to refer to this central office all calls which they receive but cannot attend to within a reasonable time, and to accept cases, from this office, if they can attend to them. If the calls become too numerous for local doctors to handle, the local board of health may call on the State Department of Health for assistance.

All nursing assistance should be under the direction of the central body.

The establishment of the emergency hospital is of special importance because with the grouping of patients it has been found feasible to obtain maximum efficiency with a minimum outlay of graduate nurses, utilizing lay workers working under their direction. The procedure in this state has been to have the mayor, or chairman of the board of selectmen, request the Adjutant-General for such assistance, this requisition to bear the approval of the district health officer. It was then forwarded to Surgeon-General Brooks, who took the necessary steps towards establishment of the tent hospital unit. The local board of health should be kept informed of vacancies in this hospital as they occur.

The assistance given by volunteer help has, in a large measure, been the saving factor in our fight. By directing their efforts, we were able to relieve doctors and nurses of everything save the immediate care of the sick. These forces furnished automobile service, arranged for supplies of foods, and, in fact, took care of detail which, if left to the ordinary channels, would have been a source of great difficulty.

Information dealing with prevention was prepared laying particular stress upon unnecessary fear which could be allayed by human contact and statement of actual facts. The distribution of the pamphlet, house to house visitation to seek out needy and sick families and attending to their needs were planned for in our circular.

Advice was likewise given as to the prophylactic measures in use such as the wearing of a gauze mask when in attendance upon patients, hand disinfection and the admonition added that local authorities take the best of care of those who were laboring for them and their community.

The success of this plan of centralization was only made possible by the coöperation of all the agencies who generously gave their time and thought, and to these the thanks of the State Department of Health is gratefully extended.

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THE OPEN AIR TREATMENT OF INFLUENZA.

William A. Brooks,
Surgeon-General, Massachusetts State Guard.

BEFORE much of this influenza appeared in Boston there were rumors of it, and then one or two cases appeared. Doctor Croke, who had charge of the ships connected with the Recruiting Service of the Shipping Board at East Boston, was instructed that if a case was found all the attendants were to be masked with gauze masks.

One Monday morning Doctor Croke reported that he was getting a great many cases of influenza. A visit was made to the ships in East Boston, where men were found scattered about on the decks and in their bunks. Apparently there were too many cases for the hospitals in Boston to accommodate in a hurry.

Mr. Henry Howard, director of the Recruiting Service, was seen and a plan was suggested to him to establish a tent hospital on Corey Hill with the assistance of the State Guard. Colonel Stevens, the adjutant-general of the Massachusetts State Guard, consented to call out the State Guard at the expense of the Shipping Board. Colonel Emery, at half-past two in the afternoon, was asked to provide tents and field equipment. Between half-past five and six o'clock the tents commenced to arrive at Corey Hill from Framingham. The Brookline Company of the State Guard was ready to erect them. Beds and hospital supplies were brought up from the Commonwealth Military Emergency Hospital. Laborers were obtained to make sewer connections and also to connect with the water supply. The State Guard medical officers were ordered to report and members of the Ambulance Corps with the ambulances came from the Commonwealth Military Emergency Hospital. Before midnight thirty-eight patients had been brought from East Boston and put to bed in the tents. For a few days the weather was bad, cold and rainy, making it extremely uncomfortable for the doctors and nurses. The tents, however, had been so thoroughly ditched by the Brookline Company that it is no exaggeration to state that the ground inside of the tents was kept perfectly dry. Within a few days many cases of pneumonia were brought to the camp. The attending physicians were greatly puzzled, for the pneumonias did not seem to be of the type which are generally met with. The patients became greatly cyanosed and the ordinary heart medicines like digitalis and strychnine apparently had no effect, and seven or eight deaths occurred in rapid succession. The attending physicians became much discouraged. Meanwhile Doctors Slack and Overlander were busy taking cultures. They soon reported that the influenza bacillus predominated in these cultures. They also found that both Type I and Type III of the pneumococci were present. They also found streptococci. Their reports indicated that the present epidemic was a mixed infection.

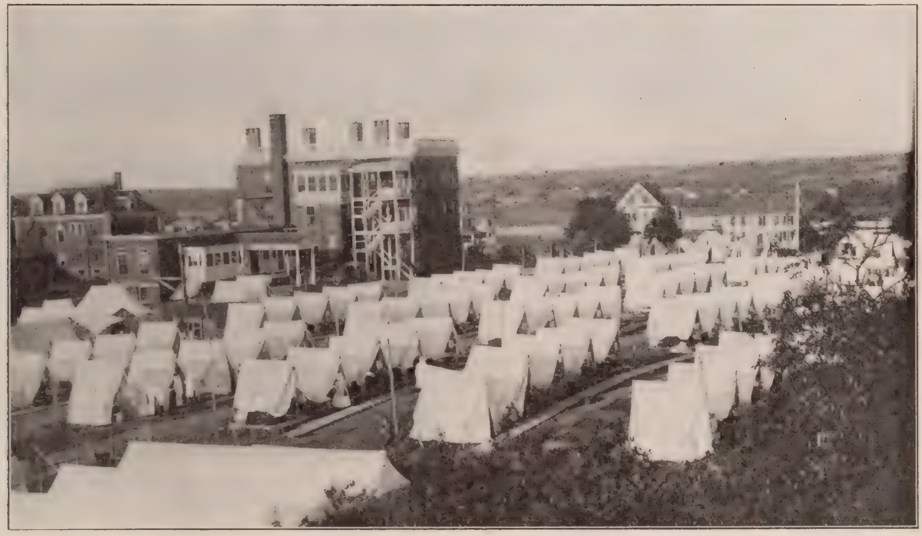

Fig. 1. Gloucester Hospital.*

In getting the history of the cases, Doctor Harrington found that the worst cases of pneumonia came from that part of the ships where the ventilation was the worst. Doctor Slack's analyses clearly demonstrated that we had to deal with the pus-producing pneumococcus. We were able to get reports from the autopsies at the Naval Hospital, showing that the men died, not from heart failure, but from abscesses in the lungs. This explained why the heart stimulants had had practically no effect on the cyanosed patients, and that they died, not from heart failure, but from lack of air.

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* The illustrations in this article are furnished by courtesy of the *Boston Transcript.*

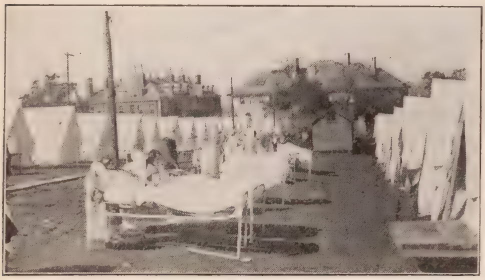

FIG. 2. Open Air and Sunshine, Camp Wm. H. Brooks, Corey Hill.

The medical staff thereafter determined to give the patients all the air possible. Thereafter, on pleasant days, every patient was taken out of the tents and put into the open.

From the first day, the results were startling. Almost every patient without exception had a lower temperature at night than in the morning, and felt decidedly more comfortable. The charts of these patients are very instructive and clearly demonstrate the great value of plenty of air and sunshine for patients suffering from influenza and pneumonia.

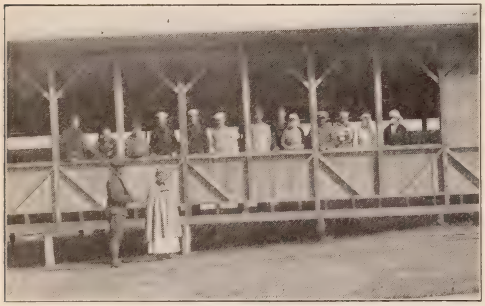

FIG. 3. Convalescence Shack, Camp Wm. Brooks, Corey Hill.

From being discouraged, the medical staff became enthusiastic, and the patients were treated with the confidence that at last something had been found which would give good results.

At the end of three weeks the epidemic on the ships was practically under control, and in a few days over four weeks the tent hospital was closed. Out of between 5,000 or 6,000 men on the ships, between 1,200 and 1,400 had contracted the disease; 351 of the most serious cases were treated at the tent hospital, of whom 35 died.

Very few of the attendants and nurses contracted influenza while working in the tent hospital. One nurse who worked for the first two days, and undoubtedly had contracted influenza before coming to the camp, having been exposed to it in her own home, died at one of the hospitals in town. Another nurse died at another hospital in town.

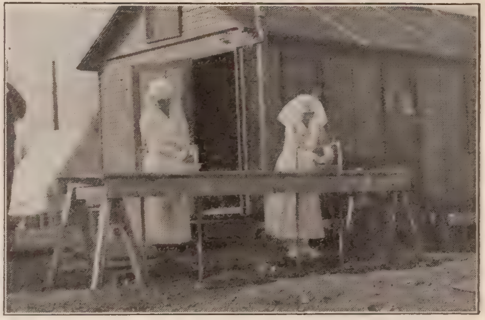

FIG. 4. Out-Door Wash Stand, Hand Technique, Camp Wm. Brooks.

The following facts were deduced from the experiences of the first tent hospital:

Period of Incubation.—Apparently it varies, averaging about two days. Sailors at work would be feeling perfectly well and then be suddenly stricken. Others would be ailing and then gradually come down. Fatigue seemed to play an important part.

The infection itself, as has been stated previously, was a mixed infection; and where Type III of the pneumococcus predominated many of the cases were fatal. In many of the cases of pneumonia, the diagnosis was made by Doctors Slack and Overlander from the sputum before any signs could be detected in the chest.

Fig. 5. Lawrence Hospital, Panorama View.

Medical Treatment.—Very little medicine was given after the value of plenty of air and sunshine had been demonstrated. Practically only three drugs were used: Dovers powder, some form of aspirin, and iodide of lime in one-third grain doses. The patients were fed every two or three hours, and given a variety of food with plenty of fruit. They were also made to drink plenty of water. Their feet were kept warm with metallic hot water bags, or else by means of heated bricks wrapped in newspapers. Owing to the danger of leakage, rubber hot water bags were avoided as much as possible.

Mask Technique.—Before the tent hospital had been established very long, it was found that the ordinary masks made out of a number of layers of gauze were very unsatisfactory. Nurses and attendants were constantly dropping the masks, and replacing them with the wrong side next to the mouth and nose. Improvised wire masks were made out of ordinary gravy strainers. The strainer was shaped to fit the nose, and five layers of gauze were simple basted on to the wire frame. No attendant or nurse was allowed to go near a patient unless wearing one of these masks. The gauze on the masks was changed every two hours. It was found impractical to sterilize the mask with the gauze on, owing to the fact that in the process of sterilization a great deal of the fuzz on the gauze was removed and its value as a strainer was diminished. Nurses and orderlies were instructed to keep their hands away from the outside of the masks as much as possible. Every wearer of a mask was inclined at first to wear the mask too high up on the nose and a great deal of discomfort was caused by this. The upper end of the mask should simply rest above the nostrils, and the lower part should come under the chin. The two tapes on the masks were tied over the ears at the back of the head or neck. There was a superintendent of masks

Fig. 6. Cook Tent, Camp Wm. Brooks.

whose duty it was to see that all the masks were changed every two hours, and to see that they were properly sterilized and fresh gauze put on.

Technique of Hands.—Every nurse and attendant was cautioned that, after working over patients, the hands should be washed thoroughly either in 1/1000 corrosive sublimate solution, or in a solution of triple lysol. Before going to mess it was required of all nurses that they wash their hands and then go directly to mess.

Observations.—There is apparently a great opposition among many of the medical fraternity against open air treatment. Many of them seem inclined to think that, if the windows of a room are open, the same object is attained. Many think that the ordinary sun parlor of a hospital is "just as good." The facts are, however, that the patients do not thrive as well in any ordinary hospital, no matter how well it is ventilated, as they do when they are put right out into the open. The objection to the sun parlor is that one gets direct sunlight only during part of the day, whereas the patient who is out in the open gets the direct sunlight all day long. Certainly these results warrant medical men in visiting these camps to go over the records, examine the charts, and hear what the patients have to say in regard to the good effects of open air treatment.

The efficacy of open air treatment has been absolutely proven, and one has only to try it to discover its value. It represents the result of study by twelve or fourteen men, who, for a month, practically devoted their entire time to influenza and its complications. Compare the following data with the results cited above, obtained from open air treatment: in one general hospital there were seventy-six cases; within three days, twenty of these cases died, and seventeen nurses were down with influenza.

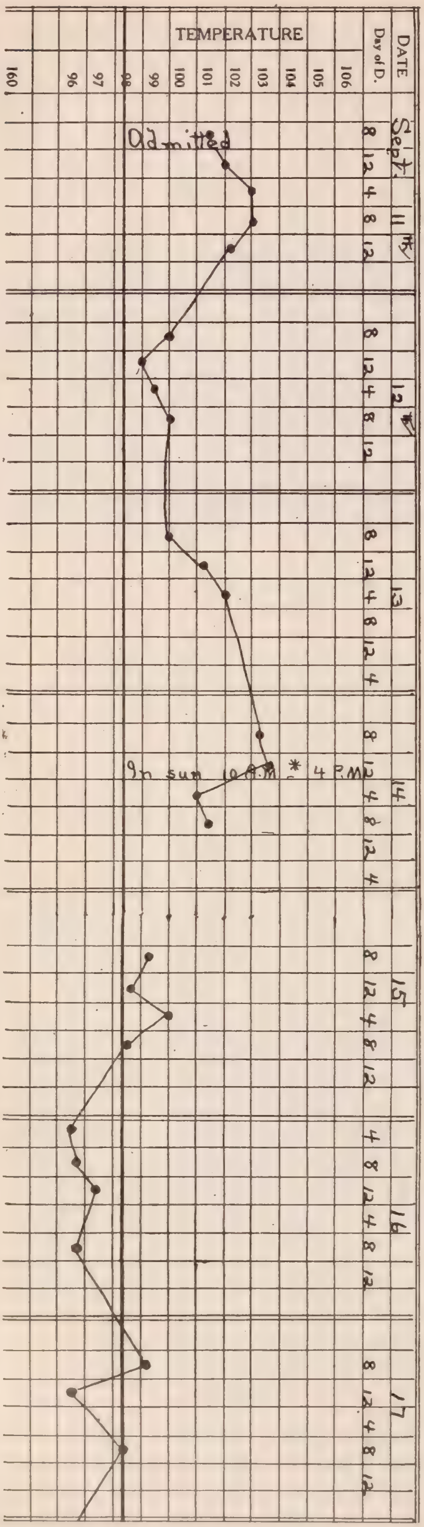

Fig. 7. Chart showing fall of temperature with open air treatment. The break between the 14th and 15th days represents the juncture of two history sheets.

THE EPIDEMIOLOGY AND BACTERIOLOGY OF INFLUENZA.

CHESTER A. DARLING, PH. D.,
Professor of Biology, Allegheny College, Meadville, Pa.

THE disease called influenza has probably existed for several centuries; it can be traced back with a fair degree of certainty to the fifteenth century and it is generally agreed that it must have been prevalent before that time. Several pandemics have been recorded, four having occured during the last century: one in 1830–33, a second in 1836–37, a third in 1847–48, a fourth in 1889–90. Pandemics are usually followed for several years by epidemics or sporadic outbreaks in different regions, so that nearly every year there are at least a few cases of so-called influenza in any given locality. A pandemic of the disease usually starts as a more or less severe local epidemic, more commonly in the Orient, and gradually spreads from that center along the lines of travel and at about the rate of travel. The pandemic of 1889–90 is believed to have started somewhere in the Far East in the spring of 1889; it reached Moscow in September of the same year, Petrograd in October, Berlin by the middle of November, London a month later, and New York the latter part of December. Within a year the disease had visited nearly every part of the world. The most plausible suggestion as to the cause of the sudden outbreak is that there develops a very virulent strain of the causative organism, possibly due to its passage successively from one individual to another, thereby increasing in virulence.

The present epidemic, which is assuming pandemic proportions, is believed by some writers to have originated somewhere in Western Asia, others speak of it as having started in Spain. During the past summer it is reported by Keegan (1), to have been prevalent in the army camps of both the Allies and the Central Powers and as having attacked from 30 to 40 per cent of the people in Germany, Italy, France, England, and Ireland. The disease began to assume epidemic proportions in the eastern United States in August and was probably brought to this country by patients or carriers from Europe. During the past two months most if not all of our army camps have been invaded and the civil population have suffered severely from the malady. In some of the camps it is reported to have attacked as high as 40 per cent of the men; since it is not a reportable disease, it is not possible to tell the proportion of persons attacked in the civil population. In the last epidemic of influenza in this country in 1915–16 it is roughly estimated that 40 per cent of the population in the large cities contracted the disease. Osler (2) says that with the exception of the tropical disease, dengue, there is no disease which indiscriminately attacks so large a proportion of the inhabitants. The season or the weather seems to have little to do in inducing an outbreak, although it may be noted that, up to the present epidemic, the greatest outbreaks in this country have occurred during the winter months, probably due to the lower resistance of the respiratory passages of the body during this season of the year.

The best evidence indicates that infection occurs through respiration, the causative organism being carried on dust particles and presumably lodging on the mucosa of the respiratory passages. The disease is probably not transmissible for great distances through the air owing to the lack of resistance on the part of the organism to dry air for any length of time. The chief means of infection is believed by many to be the fine droplets expelled by a patient or a carrier from the respiratory passages in the act of sneezing, coughing, or talking. In addition to this so-called droplet infection, the causative organism may be obtained directly or indirectly from the patient or carrier who is careless about expelling the secretions from the nose or mouth; such secretions appear to be the only infective material.

At least from a theoretical point of view isolation and quarantine of the patient is the best means of controlling an epidemic, but owing to the large percentage of persons attacked, this method does not appear to be practical except under special conditions, such as in army camps and in certain institutions. The prevention of crowds by the closing of schools, churches, theaters, and all places of public gatherings where the danger from droplet infection is greatly increased is a practical measure which tends to lessen the number of persons subject to infection. In the care of the patient the wearing of a gauze mask by the nurse or attendant while in the same room is practiced in the army camps and in many hospitals and according to Weaver (3) is an efficient method of protection.

The incubation period appears to be short, especially in the present epidemic. One to three days after exposure the disease develops. The onset of the disease is very sudden, often in one to three hours the patient passes from apparent health almost to prostration. The clinical manifestations of the disease are usually a marked prostration, a temperature of from 101° to 105°, headache, pains of varying severity in the muscles and joints, an acute attack of coryza, or discharge from the nostrils, and inflammation of the mucus membrane of the upper respiratory passages, less frequently of the intestinal tract. The main danger connected with the disease lies in the complications which follow. In the present epidemic bronchitis followed by bronchopneumonia occurs in from 5 to 10 per cent of the cases, as reported by Keegan (1) for the First Naval District Hospital. Pleurisy, inflammation of the middle ear, less frequently pericarditis, abscesses, erysipelas, peritonitis, and appendicitis are complications which may follow, according to Mathers (4).

As to the bacteriology of the disease little work had been done up until the great pandemic of 1889–90. At that time observers did not agree as to the causative agent, both streptococci and pneumococci were found in sputum and in post-mortem material from cases of the disease. In 1892 Pfeiffer (5) succeeded in isolating and growing upon blood agar a bacillus which he found in abundance in the bronchial secretions of patients suffering from an epidemic at that time; he named this organism *Bacillus influenzæ*. Pfeiffer's observations were confirmed at the time by several workers and the organism, frequently spoken of as Pfeiffer's bacillus, came to be accepted as the causative agent in the disease. In the past five years, however, considerable evidence has been brought forward indicating that *Bacillus influenzæ* is not necessarily the organism primarily concerned in epidemic influenza. Among the workers who have brought forward such evidence may be mentioned Davis (6), Mathers (4), Williams (7), Clapps and Moody (8), and others; these have failed to find the influenza bacillus in any considerable number of cases which they have examined. Of a total of 2,245 cases of clinically reported influenza examined and reported by Moody, Williams, Mathers, Ruhemann, and Lord, 157 or 7 per cent gave positive findings for the influenza bacillus. Other organisms commonly found by these investigators were *Streptococcus viridans*, *Streptococcus albus*, *Streptococcus hemolyticus*, *pneumococcus*, and *Micrococcus catarrhalis*. Mathers believes that the hemolytic streptococci are of more significance in the throat than are the influenza bacilli in cases of an epidemic. In this connection it should be noted that *Bacillus influenzæ* is frequently found in the throats and sputum of those suffering from pneumonia, tuberculosis, whooping-cough, measles, and chronic bronchitis, as reported by Davis.

In the present epidemic several investigators have found the influenza bacillus only occasionally. Hewlett and Alberty (9), reporting the epidemic from the United States Navy Base Hospital No. 2 in France, state that there is no unanimity of opinion as to the causative organism, many observers failing to find the influenza bacillus of Pfeiffer. The bacteriological findings at the United States Naval Hospital, Chelsea, Mass., as reported by Keegan, are of considerable interest in suggesting a possible reason for the failure of many bacteriologists to find the influenza bacilli in clinical cases of the disease. From over one hundred throat and sputum cultures from cases of influenza the predominating organism was a gram-positive diplococcus, the influenza bacillus being found only occasionally. From lung punctures and necropsies, however, nineteen out of twenty-three cultures gave colonies of *Bacillus influenzæ*, in six cases appearing as the only organism. The four cases which did not produce colonies of the influenza bacillus gave pure cultures of hemolytic streptococci.

The lack of agreement among bacteriologists as to the causative organisms in epidemic influenza may be accounted for in one or both of two ways; either because of the difficulty in isolating and in recognizing the colony of *Bacillus influenzæ*, or in the similarity of symptoms produced by several organisms, including the influenza bacillus. Considering the first possibility, Keegan suggests that the focus of infection of the influenza bacillus probably is not in the pharynx but in some recess of the nasal cavity; grounds for believing this he finds in the case of meningococcus which is found primarily in the back part of the nasopharynx, and the diphtheria bacillus which usually selects the region above the tonsils for its principal habitation. If this suggestion of Keegan proves to be the fact, then the ordinary swabbing of the throat and sputum examinations would give very uncertain results. Another difficulty which is met with in isolating the bacillus is in the very small colony which is produced under normal growth conditions, together with the transparency of the colony which in a mixed culture might be overlooked. Some workers maintain that there is a prohibitive action exerted upon the bacillus by other organisms which are commonly found in the throat, whereas Keegan maintains that when grown about a colony of staphylococcus, the colonies of the influenza bacillus assume a size three or four times as great as under normal conditions.

There is considerable evidence that other organisms than Pfeiffer's bacillus produce symptoms clinically diagnosed as influenza. Mather says that streptococci infection produces symptoms very similar to, if not identical with, those diagnosed as influenza. Park and Williams in their text-book make the assertion that there is no doubt that other infections are included under the clinical forms of influenza. It is a fact that the striking symptoms in acute respiratory diseases, as seen in the various types of pneumonia, are freqently due more to the location of the lesions than to the special variety of organisms producing them. In this connection the classification of Leichtenstern as accepted by Osler may serve to minimize the confusion which has arisen relative to the causative organism in the disease. Leichtenstern has divided influenza into three types: first, epidemic influenza vera, caused by Pfeiffer's bacillus; second, endemic-epidemic influenza-vera, which often occurs for several years in succession after a pandemic, caused by Pfeiffer's bacillus; and third, endemic influenza nostras, a pseudo-influenza or catarrhal fever, commonly called grip, caused by various organisms alone or in combination.

The importance of knowing the causative organism is more appreciated during these days when vaccines and sera are of so much importance in the prevention and treatment of so many diseases. The opportunities given in our army camps for studying the disease under controlled conditions will doubtless throw considerable light not only upon the epidemiology of the disease but also upon the organisms concerned in producing such epidemics as the present one.

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THE USE OF INFLUENZA VACCINE IN THE PRESENT EPIDEMIC.

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THREE strains of influenza bacilli obtained from cases during the present epidemic have been used in the manufacture of vaccine. Strain "Carney" came from a culture from the nose of a nurse at the Carney Hospital. It was present in association with a white staphylococcus in abundant growth, in contrast to the picture obtained in most nose and throat cultures, which do not usually show the influenza bacillus. Strain "Navy" was procured from Lieutenant Keegan at the Chelsea Naval Hospital. Strain "Devens" was obtained from Major Spooner through Doctor Allen.

The technic used in the preparation of vaccine follows: 1½ per cent agar has been prepared from meat infusion (beef hearts) without glucose, and made 1 per cent acid to plenolphthalein. This is autoclaved for forty-five minutes at fifteen pounds pressure after tubing. Three to five drops of human blood are added to each tube. Blood is collected from the median basilic vein—15 to 40 cc. Poorest growth occurs when the blood is added to agar at 60° C. or below. Most abundant growth appears in tubes to which blood is added, with the agar at 80° to 90° C. The greater heat leads to a brown discoloration of the blood. Colonies on red agar (60° C.) are small, translucent and discrete, and produce a fine frosting on the surface. The growth on brown agar (80° to 90° C.)

is heavier, tends to be confluent, and more opaque.

Experience seems to indicate that organisms grown on red blood agar retain their virulence in higher degree, and furnish a more efficient vaccine. Brown blood agar furnishes a more abundant crop.

After the addition of blood the agar is slanted, cooled and incubated twenty-four hours in order to control its sterility.

We have prepared in this way up to 4,000 tubes of blood-agar per day.

Seed for planting is grown on selected red tubes. Heavy seeding of tubes used for vaccine is obtained by mixing the growth on the surface of seed tubes with the water of condensation, and transferring with a loop large amounts of the emulsion to the whole of the surface of fresh tubes.

Cultivation is carried out for fifteen to eighteen hours at 37° C.

After careful inspection of growths, with a hand lens, and the discarding of all doubtful tubes, 2 cc. of saline solution are added to each tube. The growth is scraped from the surface and emulsified by means of a platinum loop and shaking. The saline suspensions are collected in small flasks and filtered through sterile gauze, to remove fragments of agar. The suspensions are then exposed to 56° C. for twenty-five minutes in a water bath. The killed suspensions are then pooled in a large bottle and added to .5 per cent carbolized saline in a proportion varying from 1 to 10 to 1 to 20, depending upon opacity. Since we have been able to obtain Three Cresols, the suspensions have been diluted directly in saline solution, containing .4 per cent Three Cresols, and have not been exposed to heat. The dosage is essentially 400,000,000 per half cubic centimeter.

We have bottled vaccine in 10 cc., 30 cc., 50 cc., and 100 cc. amber bottles, closed with test tube caps or closed nursing bottle nipples.

Sterility of vaccine is controlled by transfer of 1 cc. from each of ten bottles of each lot to blood agar, and to 25 cc. 1 per cent glucose bouillon in fermentation tubes. If controls are not satisfactory at first, storage of the vaccine will usually result in sterile controls within a few days.

Dosage.—The prophylactic dosage has been .5 per cent cc., 1 cc. and 1.5 cc. in three doses at twenty-four hour intervals. The therapeutic dosage has been .5 cc. every twelve hours. It is probable that all of these doses are too small, notably the therapeutic dose. Many men are obtaining best results with 1.5 to 2 cc. at twelve to twenty-four hour intervals.

Prophylactic Use.—The prophylactic use of vaccine will not furnish as high protection as does typhoid prophylaxis, probably because the exposure is greater and infection more readily produced. The percentage of complete protection appears to be high, and there is marked amelioration of symptoms in those who do come down, and pneumonias appear in very few cases.

Therapeutic Use.—The therapeutic use of vaccines is followed by the best results when large doses are exhibited early in the disease. It should be possible to abort a large percentage of the cases, and prevent the development of pneumonia. After pneumonia has developed, many clinicians report excellent results under large doses of vaccine. The disease is a local disease, usually limited to the respiratory tract. Blood cultures are constantly negative during life or after death. If the pneumococci or streptococci which occur in symbiosis with the influenza bacillus in the lung processes were important factors, one would expect to find them present in blood cultures at some time in the course of the disease. For

Continued on page 768.

MODERN ADVERTISING AND THE NOSTRUM EVIL.

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To be read before the Food and Drugs Section, American Public Health Association, Dec. 9-12, 1918, at Chicago, Ill.

THE evils connected with the sale of medicinal preparations of the home remedy type—the so-called "patent medicines"—are due to proprietaryship and to the advertising methods that such proprietaryship engenders. The term "patent medicines," while a misnomer, is so firmly established that its continued use seems desirable. It is applied to products, almost invariably secret in composition, that are sold under trade-marked names for the self-treatment of disease. The so-called "patent medicines" are not patented; in fact their manufacturers could not patent the products if they would and they would not if they could. They *could* not patent them because the products represent nothing new and useful, two elements that are essential to the granting of a patent; they *would* not patent them because patency, or openness, is the last thing that the average manufacturer of "patent medicines" wants.

By obtaining a trade-marked name for his product the manufacturer—or, more correctly, the exploiter, for many preparations of this sort are not made by those who sell them—gets a perpetual monoply on his preparation, instead of the seventeen-year monoply which the patent laws grant. By keeping the composition secret he can change the ingredients to suit his whim, or to take advantage of market conditions, and, more important, he is able to make claims of the most extravagant kind behind the veil of mystery that is thus raised. The perpetual proprietary monoply which the "patent medicine" seller thus enjoys makes extensive advertising profitable and has led to the gross abuses which has made the "patent medicine" business a menace to the public health.

It may be asked why there should be an objection to proprietaryship in medicaments if there is no objection to proprietaryship in other articles of trade. The answer is that there are different problems involved and immeasurably greater interests at stake. One is wholly an economic question; the other is primarily a question of public health, the economic phase being of minor importance.

MISTAKING SEQUENCE FOR EFFECT.

The man who advertises and sells a preparation for the alleged cure or alleviation of disease has an important commercial advantage over the seller and advertiser of general merchandise. The former has Nature working in his interest; the latter has Nature operating against him. The man who sells a suit of clothes or a piano or an automobile has natural forces (as expressed in wear and tear) as his competitor; the man, on the other hand, who sells a "patent medicine" has the forces of Nature as an assistant. The man who purchases a suit of clothes or a piano, even if he is not an expert judge of such merchandise, can tell in time whether or not he received value for his money; but the man who purchases a remedy for the treatment of a physical condition cannot know whether he has been humbugged because he is incompetent to decide whether, if he gets well it is *because* of the remedy taken or in *spite* of it.

There is a universal tendency to give

credit to artificial agencies for results which are really due to natural causes. There are few who are able to distinguish between cause and effect and a mere sequence of events. *Post hoc, ergo propter hoc* is the popular mode of reasoning. For example: John Doe has a passing indisposition from which, in the natural course of events, he would recover in a day or two. Obsessed, however, with the idea that he must take some positive action, he goes to his family physician who gives him some advice of a dietetic or hygienic nature and may possibly prescribe some simple drug. In the course of time Mr. Doe is himself again and the doctor's reputation enjoys a bull market, although it is altogether likely that his advice or drugs had but little to do with the recovery. Or it may be that John Doe, instead of going to the doctor, decides to take the latest advertised panacea which, of course, is recommended for just the symptoms he seems to have. In this case, also, John recovers in about the same time, and the remedy gets the credit for a result brought about by Nature. In a word, those selling remedial agents not only have the advantages of making a lucky fluke but also have the much greater chance of being given credit for results to which their remedies in no way contributed.

It is this basic fact which invalidates the claim often made by the sellers of drug products that the wide sale of their preparations over many years is proof positive of the value of the remedies. Superficially the argument seems to have weight because when applied to other merchandise it holds good. Forceful advertising may make an indifferent, or even a worthless article of general trade a profitable "seller" for some time. Sooner or later, however, the accumulated experience of the public neutralizes the "pulling" power of an advertisement and the product dies. In the case of remedial products, however, no matter how worthless they may be, the accumulation of experience is all in the other direction. Such experience is largely to the effect that whereas the purchaser was indisposed *before* he took the remedy, he was well, sooner or later, *after* taking it! And it is utterly hopeless to try to convince the man who is not scientifically trained that the fact is merely a sequence and not an effect. Add to the selling advantages of remedial merchandising, already formulated, the fact that the products may and frequently do contain drugs possessing well-marked physiologic effects (alcohol, opiates, sedatives, laxatives, etc.) and the lure becomes almost irresistible.

ADVERTISING THAT MAKES FOR ILL-HEALTH.

Modern advertising differs from its earlier prototype in that whereas the latter chiefly, if not exclusively, notified the public where and how its demands might be supplied, the former is based largely on the principle of creating demands for the products advertised. In the case of general merchandise there may be some excuse for these attempts to create in the minds of the public a desire for certain things it would not, otherwise, want. Some economic argument may conceivably be built up in defense of the proposition that the public should be impelled, through plausible and persuasive advertising, to purchase more pianos, more motor-cars, more hats or more clothes than it really can afford or has use for. No such excuse can be put forward in favor of the sale of medicaments. No man has any moral right to so advertise as to make well persons think they are sick and sick persons think they are very sick. Such advertising is an offence against the public health.

And yet a study of modern medical

advertising shows clearly that this is exactly what is being done. By the skillful use of testimonials, by plausible claims, direct or inferential, the vendors of remedial products lead the public to magnify every trivial ailment, to deceive those who are well into the belief that they are sick, and further, to impress the idea that their products are panaceas for whatever ailments the public is suffering from or can be deceived into believing itself to be suffering from.

Plenty of Non-Proprietary Home Remedies.

Under present economic conditions there is a place for medicaments of the home-remedy type for the self-treatment of simple ailments. Such remedies, however, should conform to certain simple rules. They should contain no dangerous or habit-forming drugs; they should not be recommended for diseases that are obviously too serious to be self-treated; they should be non-secret, that is, the names and amounts of all the active ingredients should be declared on the label; and finally, they should not be sold under claims that are false and misleading, or that will tend to make the public magnify trivial ills and dose itself unnecessarily with drugs. These requirements are fundamental, and their reasonableness is so obvious as to require no argument. It is virtually hopeless, though, to expect the vendors of proprietary remedies to conform to them. It is hopeless because, as a commercial proposition the margin of profit in the sale of remedies thus sold would be so small as to offer no attraction to individuals who had but one or two products to market. As a matter of fact, there is everything to be said in favor of non-proprietaryship in the sale of home remedies. There is already on the market in the form of official products an ample list to meet every legitimate requirement for medicaments for self-treatment. Such preparations are to be found in the Pharmacopeia or in the National Formulary; their composition is non-secret; their purity is established and protected by law. As any competent pharmaceutical house can make them, the elements of secrecy and proprietaryship are removed and the incentive to fraudulent or misleading advertising claims is abolished.

Under ideal conditions such products, if advertised at all, would be advertised by the individual druggist that had them for sale and the advertising "copy" would be of the "listing" rather than the "selling" type. Just as today the druggist occasionally lets the public know that he has on sale at specified prices, castor-oil, Epsom salts, compound cathartic pills, etc., so he would further extend that list were the public dependent on preparations of this type for the self-treatment of their simpler ailments. It is, of course, against the tenets of twentieth century advertising simply to offer products for sale rather than to attempt to sell them. But the fundamental difference between ordinary merchandise and products that are sold for the alleviation or cure of human ailments, is so wide and the social problem involved is so deep that there are good and sufficient reasons for abandoning modern advertising methods in selling medicaments.

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THE EFFECT OF PUTREFACTIVE ODORS UPON GROWTH AND UPON RESISTANCE TO DISEASE.

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To be read before the Sanitary Engineering Section, American Public Health Association, Dec. 9–12, 1918, at Chicago, Ill.

THE idea,—once so widely current,—that odors of putrefaction play an important part in the causation of disease, was in the main no doubt due to natural but wholly erroneous assumptions. The conclusion that what was esthetically unpleasing would also be harmful was a tempting one; and the fact that filthy conditions, which lead to foul odors, may also, as a matter of fact, tend to favor the spread of disease germs, by flies and in other ways, helped to confuse the issue.

In addition to such unjustified assumptions there has been before us, for the last twenty years, at least one definite and apparently carefully conducted piece of experimental work which seemed to demonstrate a specific effect of putrefactive odors on resistance to bacterial infection. This was the study conducted by G. Alessi at the University of Rome, translated into English and published in the *Journal of the Sanitary Institute* (Vol. XVI) in 1895.

Alessi's Experiments.

Alessi's experiments were made upon rats, guinea pigs and rabbits. The rats were exposed to putrefactive gases by placing their cage over an untrapped water-closet,—the guinea pigs and rabbits by placing beneath their cages vessels of excrementitious substances. The animals exposed to the gases of putrefaction "lost their usual vivacity and pined away, in spite of eating voraciously." After specified periods, they were inoculated with broth cultures, or suspensions of agar cultures, of two strains of typhoid-like organisms and one strain of *Bacterium coli.* Alessi points out that one of his supposed typhoid strains (A) was evidently not a true *Bacterium typhi.* The identity of the organisms is unimportant, however, since the amounts used for injection (.25–.50 cc.) proved generally harmless to control animals injected in the same way. The animals which had been exposed to the putrefactive gases on the other hand were made seriously ill and a large proportion of them died, the typhoid or colon bacillus injected (as the case might be) being usually isolated in nearly pure culture from the blood, spleen and other organs.

The general results of Alessi's experiments are summarized in Table I below. The average time of exposure to the putrefactive gases "necessary for the animals to acquire the predisposition" was 3 to 6 days with guinea pigs and rabbits inoculated with Typhoid B and *Bacterium coli*, while for Typhoid A the average time was 5 days for rabbits, 18 days for guinea pigs and 22 days for the rats. It is not clear from the original paper how this time necessary to acquire predisposition was determined. It is stated however that "90 per cent of the animals inoculated in the first two weeks died, and 76 per cent of those inoculated in the following weeks," suggesting a gradually acquired tolerance. Death generally ensued within 24 hours after inoculation, though in a few instances the animals survived for as long as 13 days.

TABLE I.

SUMMARY OF ALESSI'S RESULTS ON EFFECT OF BREATHING PUTREFACTIVE GASES UPON SUBSEQUENT REACTION TO BACTERIAL INFECTION.

Culture Used	Type of Animal Inoculated	Percentage Mortality	
		Exposed Animals	Normal Controls
Bacterium typhi A.....	Rats	75	7
	Guinea pigs	79	0
	Rabbits	100	0
Bacterium typhi B.....	Guinea pigs	80	0
	Rabbits	70	0
Bacterium coli..	Guinea pigs	83	0

Finally, in the attempt to determine whether any of the known chemical constituents of the putrefactive gas complex could be shown to be responsible for these results, Alessi exposed rats and guinea pigs for periods of one to two weeks to the gases in question under bell jars and then inoculated them with the same sublethal doses of typhoid bacilli described above. The gases studied were retilindol, ammonia, sulphuretted hydrogen, methyl sulphide, carbonic acid, carbonic oxide, ammonium sulphide, alone, and in various combinations. All these known gases and mixtures proved innocuous. Out of 56 animals exposed only 3 died "from other causes."

DELÉPINE'S EXPERIMENTS AT MANCHESTER.

The next important contribution to this subject was made by Professor Delépine at Manchester, England (described in the Report of the Departmental Committee appointed by the President of the Local Government Board to inquire and report with regard to the use of Intercepting Traps in House Drains, London, 1912). Delépine was interested not in the general question of putrefactive gases but in the practical problem of sewer gas. His animals were kept in two rooms supplied by forced ventilation with air drawn, respectively, from a garden and from a main city sewer. The animals studied were cats, rabbits and guinea pigs (young, adult, normal and diseased). The period of exposure varied from 7 to 83 days and the chief criterion of the effect of the sewer air was the growth curve of the animals as shown by daily weighings. A careful comparison of the rate of growth of seventeen animals exposed to each condition failed to show any influence of the sewer air. No attempt was made to inoculate these experimental animals, but an epidemic "due to infected food" which broke out towards the end of the experiments gave an excellent chance of observing any difference in resistance toward naturally contracted disease. No such difference appeared; 9 out of 17 animals supplied with sewer air died during the course of the experiments as against 10 out of 17 supplied with garden air.

These experiments can scarcely be considered as conclusive, partly on account of the small number of animals studied, but chiefly because the air of a city sewer does not contain under ordinary circumstances any very heavy concentration of putrefactive gases. The results are important in connection with the possible effect of air pollution from street sewers (upon which they were designed to throw light); but they by no means exclude the possibility that strong concentrations of putrefactive gases, such as those with which Alessi worked, may have an effect such as that which Alessi claimed to have discovered.

RECENT COMMUNICATIONS OF PUNTONI.

The whole question of the effect of putrefactive gases upon health has been re-opened in a series of recent papers, again by an Italian worker, Puntoni.

In the first of these communications, on The Hygienic and Epidemiological Significance of Putrefactive Gases (Il Policlinico, Roma, XXI, 1914), Puntoni reports the exposure of white mice to gases evolved from the viscera of guinea pigs decomposing under water. The vessel in which the decomposition took place was kept at incubator temperature and, by means of an aspirator, air was drawn through the putrefying liquid, thence through a condenser tube where it was cooled and the excess of moisture removed, and finally through the bell jar in which the mice were confined. The mice exposed to the putrefactive gases in this manner all died, sometimes in 12 hours, sometimes after 10 to 12 days, showing "a pulmonary lesion of congestive nature and degenerative necrotic alterations of the liver, the kidneys and the intestine, caused by the destruction or elimination, through these organs, of the circulating poisons." The gases formed during the first 2 or 3 days were most toxic, killing the mice in 12 to 24 hours, while after the putrefaction had gone on for a week the mice exposed to the gases did not die. The putrefactive gases, it was estimated, formed less than 1 part in 1,000 of the total air aspirated through the apparatus.

In herbivorous animals such as guinea pigs, in whose intestines according to Puntoni colon-typhoid organisms are less abundant, the effect of the putrefactive gases was either absent or much less marked.

In a second paper on The Influence of Putrid Exhalations on Microbes of the Colon Typhoid Group Contained in the Intestine, Puntoni reports that the bacterial flora of normal mice is made up chiefly of colon bacilli of low virulence, while in the intestines of mice killed or made ill by inhalation of gases of putrefaction the colon bacilli become highly virulent and other forms resembling the typhoid bacillus make their appearance. In another series of experiments mice exposed to mildly toxic gases (from old putrefying infusions) were found to be highly susceptible to infection by mouth with typhoid and paratyphoid bacilli, while mice kept in the open air, but fed with the same cultures, remained well. This predisposing action of the putrid gases could not be demonstrated with dysentery and cholera organisms. It was concluded, not only that the resistance of the intestinal wall was lowered by the inhalation of putrid gases, but that the bactericidal power of the blood was definitely lowered.

Finally, in a third paper on The Action of Putrefactive Gases on Typhoid and Paratyphoid Microbes latent in the Intestine (Annali d'Igiene, XXVI, p. 3, 1916), Puntoni reports a series of experiments in which white rats were fed for periods of 15 to 20 days on food infected with typhoid and paratyphoid bacilli. After this period the animals were placed in sterilized cages and fed on dry foods, under which conditions the typhoid and paratyphoid bacilli quickly disappeared from their feces (within 48 hours). Three to fifteen days later the rats were exposed to putrefactive gases as above and, after they had succumbed to the toxic action, typhoid bacilli were isolated from the intestinal contents in 3 out of 13 cases, paratyphoid A in 1 case out of 11, and paratyphoid B in 1 case out of 9. Puntoni concludes that "when putrefactive gases are respired, they may injure the intestinal wall, reviving and making virulent the pathogenic microbes always present in the intestines."

The bacteriological results reported in these experiments do not appear to us particularly significant. In dead or moribund animals it is well known that intestinal bacteria will invade the tissues and where the intestinal wall has been almost destroyed by necrosis (a condition described by Puntoni) virulent strains might naturally predominate. The important fact is that air aspirated through putrefying infusions under the conditions of the experiments contains substances (not necessarily gases, for solids and even bacteria might be carried through such an apparatus) highly toxic to white mice. The exposure in such an apparatus is however so very severe as to rob the experiments of much practical bearing.

EXPERIMENTS OF THE NEW YORK STATE COMMISSION ON VENTILATION.

A much more modest influence of air containing odoriferous substances is suggested by some experiments of the New York State Commission on Ventilation reported by Winslow and Palmer (Proceedings of the Society for Experimental Biology and Medicine, 1915, XXI, 141). Here the subjects were human beings and the exposure was to the ordinary air of an unventilated room, containing whatever substances are given off by the body and clothing of the occupants under such conditions, the temperature and humidity of the room being regulated by artificial means. It was found that "neither the pulse, blood pressure, body temperature, respiration nor metabolism are influenced to a measurable degree when human subjects are exposed for periods of from 4 to 7 hours to the air of a room in which all the chemical products due to human occupancy have been allowed to accumulate (so that the carbon dioxide averages over 30 parts per 10,000) —provided the temperature of the chamber be kept down." One unexpected effect however was noted. The subjects while in the experimental chamber were served with a luncheon, made up of weighed portions of known calorific value, and the amount of food left uneaten was weighed to determine by difference the amount consumed. Five series of experiments were made, one of which was vitiated by the fact that in the middle it was found that religious dietary laws were preventing the use of certain of the articles served. In this uncompleted series the subjects exposed to the stale air ate 4.9 per cent more than when supplied with fresh air on control days. In all the four completed and significant series, however, the subjects ate more on the fresh-air days, the percentage excesses being respectively 13.6, 8.6, 4.4 and 6.8 per cent. Each of these figures represents the average of from 71 to 196 meals. "These experiments," the authors state, "seem to warrant the conclusion that there are substances present in the air of an unventilated occupied room (even when its temperature and humidity are controlled) which in some way, and without producing conscious discomfort or detectable physiological symptoms, diminish the appetite for food."

These experiments are of course only in part analogous to those previously discussed, since there was no definite attempt to pollute the atmosphere with putrefactive gases. It may be assumed however, as a working hypothesis, that the effect of odoriferous substances from skin and clothing upon the sense organs was the most probable cause of the loss of appetite in these experiments. If so, they may fairly be considered to represent a very mild exposure to influences similar to those which operated in a more extreme form in Alessi's experiments.

PLAN OF THE PRESENT INVESTIGATION.

It was our plan in the present study to repeat the experiments of Alessi as closely as possible. The conditions of Delépine's work seemed to us too mild, and those of Puntoni too rigorous, to be promising of valuable results. Young guinea pigs (weighing at the start between 150 and 300 grams) were used in all of our experiments, which were conducted in fifteen different series during the years 1916, 1917 and 1918, 261 animals in all being observed.

The method of exposure to the putrefactive gases was as follows: A galvanized iron box 4 feet wide, 2 feet deep and 3 feet high was constructed, divided into two equal vertical compartments, each holding two standard animal cages and each provided with a tightly fitted separate glass door. Fresh air to the amount of 1.5 cubic feet per minute for each compartment (amounting to 4 liters per minute per animal) was supplied to the box by a small centrifugal fan, the supply to each section of the box being carefully regulated by dampers. On the course of the branch duct leading from the fan to one compartment was inserted a chamber in which was placed a pan of fresh moist human or dog feces, so as to produce a strong fecal odor.

In each series of experiments, from 5 to 13 guinea pigs were placed in the compartment supplied with the air drawn over the feces, while a similar number of control animals were placed in the other compartment supplied with ordinary air. All conditions were apparently alike for both groups, except for the presence or absence of the odor. The period of exposure in different series varied from 4 to 30 days.

During the course of the experiments the animals were weighed to see whether any effect of the odor upon their growth curve could be detected, as would be the case if the guinea pigs were affected as human subjects were affected in the New York State Commission on Ventilation experiments. When the animals were removed from the experimental chamber they were inoculated with a culture of *B. coli* (Series I–X) or with diphtheria toxin (Series XI–XV) as described below, to detect any diminution of vital resistance such as was reported by Alessi.

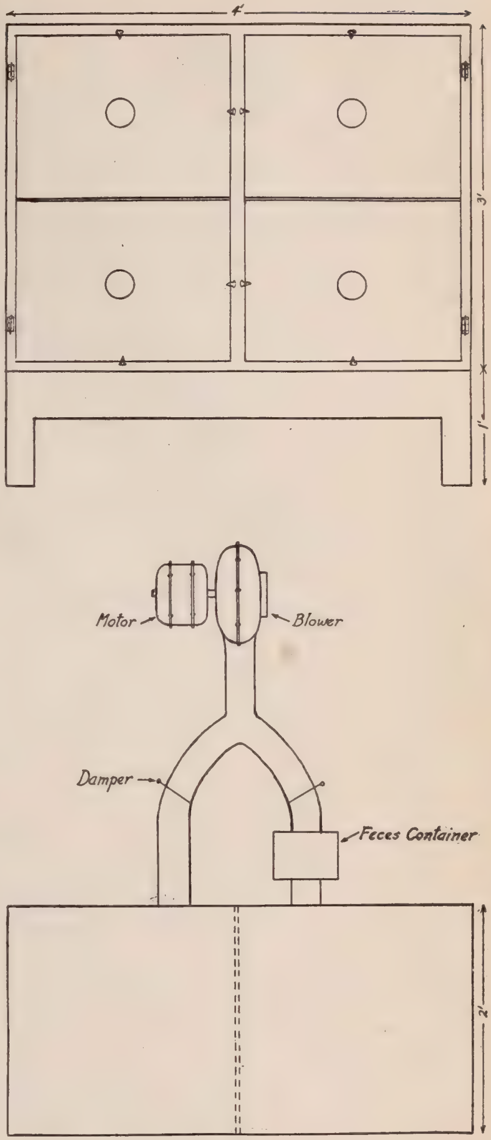

FIG. 1. Details of Experimental Chamber.

EFFECT OF PUTREFACTIVE ODORS UPON GROWTH CURVE OF GUINEA PIGS.

The average results of the weighings of each series are presented in Tables II and IIA in the form of average gain in

TABLE II.

Average Gain in Weight of Experimental Animals—First Sixteen Days.

Gains in Grams Per Day Since Beginning.

No. of Animals	Days															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
I. *C. 12							17.8							19.8		
†E. 13							8.7							23.1		
II. C. 13					11.8						24.5				41.3	
E. 13					19.9						14.2				40.4	
III. C. 7						25.8										
E. 7						16.9										
IV. C. 10					15.6	27.0		29.3		37.2					48.0	
E. 10					12.4	24.6		27.4		34.5					28.0	
V. C. 11			7.6		9.6		13.9								32.8	
E. 11			8.7		12.1		19.6								34.2	
VI. C. 8			3.3			3.6								18.7		
E. 8			0.1			−0.1								16.7		
VII. C. 10			17.5			35.4			30.2			36.0				
E. 10			12.5			30.0			18.2			24.4				
VIII. C. 10		26.1		28.1	31.1			42.6		46.4						
E. 10		20.6		15.7	19.9			22.4		30.7						
IX. C. 9	11.0	8.4	8.8	12.9	12.2	13.1	7.2	2.2	10.2	11.4	15.8		15.6			
E. 9	7.3	5.8	8.0	11.1	11.9	15.5	11.2	15.0	19.8	19.8	24.2		29.4			
X. C. 10	21.4	12.6	18.2	11.5	16.6	18.9	12.4	19.5	19.2	22.4	24.2	28.4	25.0	27.5	28.0	28.5
E. 11	19.5	9.8	19.5	11.8	17.8	17.5	15.8	20.3	21.1	17.8	18.7	19.7	22.4	25.8	24.6	25.0
XI. C. 8	−3.9	−4.1	−5.5	−4.9	3.0	7.4	7.7	8.7	9.5	21.1	22.3	25.7	21.9	20.8	25.5	29.1
E. 8	−3.9	−3.8	−11.6	−16.8	−9.3	−6.3	0.6	8.0	7.4	16.6	20.1	24.9	18.5	20.0	25.7	30.1
XII. C. 9	−14.9	−15.3	−4.6	−7.3	−2.4	1.7	9.9	6.2	−1.0	−6.0	−2.0	7.3	17.0	−0.8	15.5	
E. 9	−13.6	−17.1	−7.8	−12.9	2.0	3.2	5.4	14.0	3.5	−4.3	6.0	12.7	22.5	1.8	23.8	
XIII. C. 6	4.3	10.7	13.7	14.0												
E. 5	1.6	4.6	5.4	9.2												
XIV. C. 7	7.6	12.6	13.6	17.3	19.6											
E. 7	11.6	11.7	16.4	21.0	20.0											
XV. C. 5	−16.0	−7.6	−6.6	−1.4	1.6	4.2										
E. 5	−14.2	−13.6	−23.0	−15.2	−10.6	−7.0										

* Controlled. † Exposed.

TABLE IIA.

Average Gain in Weight of Experimental Animals—Latter Part of Series 1 and 10.

Gains in Grams Per Day Since Beginning.

No. of Animals	Days													
	17	18	19	20	21	22	23	24	25	26	27	28	29	30
I C. 12						38.4				43.2				
E. 13						39.9				50.6				
X C. 10	32.2	37.4	36.8	40.0	38.5	42.2	43.6	53 2	55.4	58.5	60.2	58.9	60.5	65.2
E. 11	32.4	33.6	36.0	35.4	36.8	37.8	42.2	54.4	54.4	59.6	59.0	62.6	63.2	66.6

grams per animal since the beginning of each experiment.

It will be noted that the results for individual series were somewhat variable: in general however it was evident that the animals exposed to the fecal odor did not grow as fast for the first week as did the controls. Later, they gained more rapidly and by the end of two weeks had generally caught up. This relation appeared in 12 of the 15 series, while in the other 3 (Series 2, 5 and 14) it did not.

In order to eliminate the factor of individual chance variation, which must always be considerable in a single series of experiments involving the use of a few animals, we have calculated in Tables III and IV the per cent gain in weight for each series of animals (based on the weight of the series at the beginning of

TABLE III.

INCREASE IN WEIGHT OF ANIMALS EXPOSED TO PUTRID GASES.

In Per Cent of Original Weight of Each Series Gained Since Beginning.

Series	Days														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	*.6*	*1.2*	*1.8*	*2.4*	*2.9*	*3.5*	4.1	*5.1*	*6.0*	*7.0*	*7.9*	*8.9*	*9.9*	10.8	*11.7*
2	*1.6*	*3.3*	*5.0*	*6.7*	8.5	*8.2*	*7.9*	*7.5*	*7.2*	*6.9*	6.6	*9.6*	*12.7*	*15.8*	19.0
3	*1.1*	*2.3*	*3.4*	*4.6*	*5.8*	7.0									
4	*1.2*	*2.4*	*3.7*	*4.9*	6.2	2.4	*13.1*	13.8	*15.6*	17.4	*16.9*	*16.5*	*16.0*	*15.5*	15.0
5	*1.6*	*3.2*	4.7	*5.6*	6.6	*8.6*	10.6	*11.7*	*12.9*	*14.1*	*15.3*	*16.4*	*17.6*	*18.8*	20.0
6	*.0*	*.1*	.1	*.1*	*− .1*	−.1	*1.7*	*1.6*	*2.5*	*3.4*	*4.3*	*5.2*	*6.1*	7.0	
7	*2.5*	*5.0*	7.6	*11.0*	*14.5*	18.2	*16.0*	*13.8*	11.7	*12.9*	*14.3*	15.6			
8	*5.4*	10.9	*9.6*	8.4	10.6	*11.5*	*12.4*	13.4	*15.8*	18.3					
9	3.8	3.0	4.1	5.7	6.1	8.0	6.6	8.7	11.6	11.6	14.1	*15.6*	17.2		
10	12.6	6.2	12.6	7.6	11.4	11.2	10.2	13.1	13.5	13.2	13.6	14.3	15.8	18.2	17.9
11	−1.6	−1.6	−4.9	−6.9	−3.9	−2.6	3.0	3.3	3.1	6.9	8.7	10.4	7.7	8.5	10.7
12	−5.3	−6.7	−3.0	−5.0	.8	1.3	2.2	5.9	1.6	−1.8	2.6	5.5	9.4	.7	10.0
13	.8	2.2	2.6	4.4											
14	6.5	6.5	9.1	11.7	11.2										
15	−3.9	−3.7	−6.2	−4.2	−2.9	−1.9									
Average	1.8	2.3	3.3	3.8	5.6	6.6	7.7	8.9	9.2	10.0	10.4	11.8	12.5	11.9	14.8

TABLE IV.

INCREASE IN WEIGHT OF CONTROL ANIMALS.

In Per Cent of Original Weight of Each Series Gained Since Beginning.

Series	Days														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	*1.2*	*2.4*	*3.5*	*4.7*	*5.9*	*7.1*	8.3	*8.4*	*8.6*	*8.7*	*8.9*	*9.0*	*9.2*	9.3	*10.4*
2	*1.0*	*2.0*	*3.0*	*4.0*	5.0	*6.1*	*7.2*	*8.3*	*9.5*	*10.6*	11.8	*13.7*	*15.6*	*17.5*	19.5
3	*1.8*	*3.6*	*5.4*	*7.2*	*9.1*	11.0									
4	*1.5*	*3.1*	*4.7*	*6.2*	7.8	13.6	*14.2*	14.8	*16.7*	18.7	*20.4*	*22.1*	*23.8*	*25.6*	27.3
5	*1.4*	*2.8*	4.1	*4.6*	5.2	*6.4*	7.6	*9.0*	*10.5*	*12.1*	*13.6*	*15.1*	*16.6*	*18.1*	19.7
6	*.5*	*.9*	1.4	*1.4*	*1.5*	1.5	*2.3*	*3.2*	*4.0*	*4.9*	*5.8*	*6.6*	*7.5*	8.4	
7	*3.4*	*7.0*	10.7	*14.4*	*18.0*	21.5	*19.9*	*18.2*	16.7	*17.7*	*18.8*	19.9			
8	*6.3*	13.9	*14.4*	15.0	16.6	*19.4*	*22.3*	25.3	*26.4*	27.6					
9	5.7	4.4	4.5	6.7	6.3	6.8	4.0	1.2	5.6	6.3	8.7	*8.6*	8.6		
10	13.4	7.9	11.4	7.2	10.4	11.8	7.7	12.2	11.9	15.4	16.5	19.5	17.2	18.9	19.1
11	−1.6	−1.8	−2.3	−2.0	1.3	3.1	3.2	3.7	4.0	8.8	9.3	10.7	9.1	8.7	10.7
12	−5.8	−6.0	−1.8	−2.9	−1.0	.7	3.8	2.7	− .4	−2.6	−.8	3.1	7.3	.3	6.6
13	2.3	5.4	6.9	7.2											
14	4.2	7.0	7.6	9.6	10.9										
15	−4.4	−2.1	−1.8	− .4	.4	1.1									
Average	2.1	3.4	4.8	5.5	6.9	8.5	9.1	9.7	10.3	11.7	11.3	12.8	12.8	13.4	16.2

the experiment). For days on which weighings were not made, values have been interpolated, on the assumption of a steady progressive change between weighings, these figures being indicated by italics in Tables III and IV. Periods beyond 15 days have been omitted on account of the small number of observations.

Finally the average daily per cent increase in weight for exposed and control animals have been calculated in the last lines of Tables III and IV and these values are plotted in Figure II.

It appears evident from these figures that the breathing of the gases from putrefactive materials did exert a restraining influence upon the growth of the exposed animals during the first week of exposure, but that this effect was a transitory one, the exposed animals becoming gradually accustomed to the odor and growing as fast or faster than the controls during the second week.

EFFECT OF PUTREFACTIVE ODORS UPON VITAL RESISTANCE OF GUINEA PIGS.

At various periods during the course of the experiments animals were taken in equal numbers, from the compartment exposed to the putrefactive odors, and from the control compartment, for inoculation, to test the possibility of diminished vital resistance; and at the end of each series all the remaining animals were subjected to the same treatment.

In Series I–X the inoculation was made with living cultures of *B. coli* to duplicate Alessi's experiments. The organism used was No. 52 of the American Museum of Natural History collection, a strain originally isolated from the Chicago River. A standard loopful of this organism was transferred from nutrient agar to nutrient broth and incubated for 18 hours at 37° C. One standard loopful of this broth culture was then spread evenly over a measured area of an agar slant and incubated for 18 hours at 37° C. The growth was then washed off and suspended in 5 cc. of normal saline solution. Preliminary tests indicated that one eighth of a cubic centimeter of such a suspension was constantly lethal when injected intraperitoneally, while one ninth of a cubic centimeter sometimes produced a fatal result, and sometimes failed to do so. One ninth of a cubic centimeter was therefore

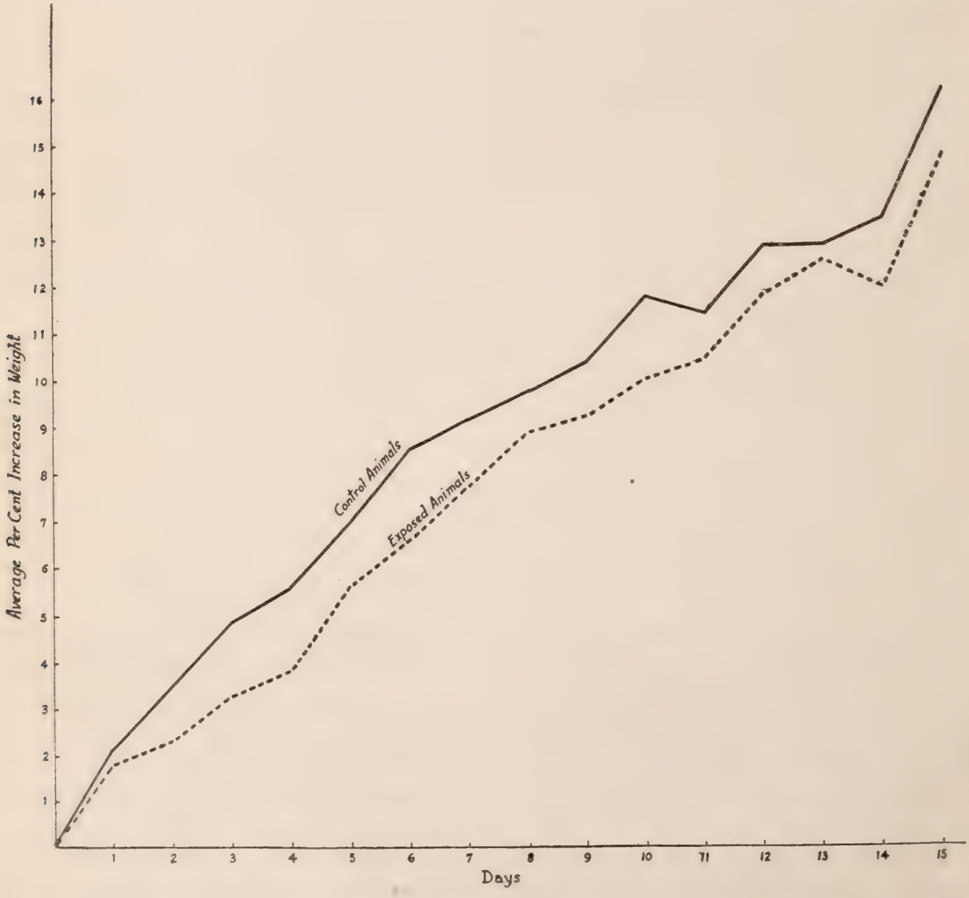

FIG. 2. Growth Curve of Guinea Pigs Exposed to Fecal Odors Compared with Curve for Control Animals.

injected peritoneally as our standard test of vital resistance.

The periods of exposure to the putrefactive gases at the end of which the inoculations were made varied in the different series from 5 to 26 days. The results of the inoculations are shown in Table V, without reference to the period of exposure, which appeared to have no significance.

TABLE V.

Results of Inoculation with B. Coli.

Series	Exposed Animals		Control Animals	
	Died	Survived	Died	Survived
1	13	0	12	0
2	13	0	11	2
3	6	1	4	3
4	10	0	10	0
5	9	2	10	1
6	6	2	3	5
7	9	1	7	3
8	5	5	7	3
9	7	2	8	1
10	0	5	0	5
Total	78	18	72	23

The treatment was rather severe, causing the death of three quarters of the inoculated animals. The fatal result occurred within 24 to 36 hours and was accompanied by a marked peritonitis. No increased susceptibility due to the putrid gases was apparent, the difference between the groups being so slight as to have no significance.

In Series XI–XV the animals were injected with a more accurately standardized inoculum, a sublethal dose of diphtheria toxin. This toxin was courteously furnished to us by Dr. A. P. Hitchens of the H. K. Mulford Company. Its minimum lethal dose was determined as .005 cc. for a 250 gram guinea pig and in all of our experiments .004 cc. was used, injected subcutaneously.

In Series XI, XIII, XIV, and XV the injection was made at the completion of the experiment, after 16 days, 4 days, 5 days and 6 days, respectively. In Series XII half of the animals were injected after 7 days and the rest after 15 days.

TABLE VI.

Results of Injection with Diphtheria Toxin.

Series	Exposed Animals		Control Animals	
	Died	Survived	Died	Survived
11	1	7	3	5
12	2	7	1	8
13	1	5	3	3
14	2	5	1	6
15	0	5	1	4
Total	6	29	9	26

Of the fifteen animals which succumbed, eleven showed definite symptoms of diphtheria intoxication, with engorgement of the adrenal glands and marked hemorrhagic gelatinous edema at the site of inoculation. Death resulted in from 4 to 9 days, usually in 4 to 6 days. Three of the animals died of pneumonia and in one case the picture was doubtful. It was evident that the putrefactive odors had no harmful effect, the death-rate being slightly higher among the control animals.

Summary and Conclusions.

1. Our experiments with guinea pigs exposed to putrefactive odors from moist feces do not indicate that such exposure has any influence upon the resistance of these animals to sublethal inoculations with colon bacilli or to sublethal injections of diphtheria toxin. There seems no particular reason to expect any such influence, except for the remarkable results reported by Alessi. It was the desire to repeat and verify his observations which dictated the technique of our experiments; and our results entirely fail to substantiate Alessi's claims of a reduction in resistance against bacterial inoculation. Our experiments have no direct bearing upon the work of Puntoni who studied the effect of putrid gases

primarily upon the intestinal flora and the resistance of the intestinal wall; but the conditions with which Puntoni worked were so extreme that they do not appear of special interest from a practical standpoint.

2. On the other hand we find that the odors from moist feces do have a real, although slight and transitory, influence upon the growth curve of guinea pigs. For the first week of exposure, animals breathing such gases gain in weight less rapidly than normal controls. Later they become accustomed to the odors and grow as rapidly as the controls, indeed tending to catch up with them in weight by the end of the second week. The difference between these results and those reported by Delépine may most probably be explained by the fact that gases of putrefaction must have been in much lower concentration in his experiments, although the number of animals used by him was in any case perhaps too small to reveal such slight differences as we have found. Our results may probably be considered to be analogous to those reported by the New York State Commission on Ventilation in regard to the effect of stale air upon the appetite of human beings.

3. Finally it may be concluded that the effect of putrefactive odors upon resistance to disease remains unproven (unless they are present in such extreme concentration as to be directly toxic, as in Puntoni's experiments). It does appear, however, that such gases may exert a real but transitory effect upon the appetite for food in human beings, and upon the growth curve of guinea pigs, an effect which in each case tends to disappear as the subjects become accustomed to the odors in question.

◆

THE USE OF INFLUENZA VACCINE IN THE PRESENT EPIDEMIC.

By Timothy Leary, M. D.

Continued from page 754.

these reasons the objections which are made to the use of vaccines in the treatment of septicemias do not hold in the pneumonias of the present epidemic.

Each injection of vaccine should be made into a new muscle group. It is the belief of the writer that the muscles are important producers of immune substances. In no other way is it possible to explain the rarity of bacterial infection of muscles, even when the viscera, blood and lymphatic systems show deep infections. In a local disease, limited as this is to the respiratory system, it should be possible theoretically to awaken the muscle groups to an activity, which they do not exhibit in response to an infection in which the organisms are localized in one part of the body.

Vaccine treatment is not recommended in moribund cases with massive pneumonias and cyanosis. Unlike antitoxins, vaccines require reacting ability on the part of the patient.

◆

SUGGESTED MODIFICATIONS OF THE STANDARD METHOD FOR THE STUDY OF THE DUST CONTENT OF AIR.

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To be read before the Laboratory Section, American Public Health Association, December 9–12, 1918, at Chicago, Ill.

IN the final report of the Committee on Standard Methods for the Examination of Air of the American Public Health Association[1] the use of the Palmer Water Spray apparatus[2] was recommended as a method for the examination of dust in air, and it was adopted by the Association at the Cincinnati Meeting in October, 1916. The Laboratory of Hygiene of the University of Pennsylvania and the Clinic for Diseases of Occupation of the University Hospital have been employing this apparatus in an extended investigation of the problem of dust in industry, and have found it to be very satisfactory in use and to yield most interesting and instructive findings. We have followed the directions of the standard methods as to collection of samples and preparation for counting, but have used a decidedly different scale of size classification of particles which we feel has distinct advantages over that suggested by Palmer and his colleagues.[3] Their directions call for five classes based on the area of the particles as compared with the standard unit or smallest ruled square in the Sedgwick Rafter eye piece: Class 1, Large masses, about 100 standard units (.04 sq. mm.); Class 2, About 25 standard units (.01 sq. mm.); Class 3, About 1 standard unit (.0004 sq. mm.); Class 4, About $\frac{1}{4}$ standard unit (.00014 sq. mm.); Class 5, Dust too fine to count—presence indicated by a plus sign.

Dust particles as observed by us are so extremely irregular in outline, especially fibrous vegetable dust and spiculate crystalline mineral dusts, that we find it extremely difficult to estimate the area without taking two or three measurements of each particle and feel that such estimates are very inaccurate and do not convey a true idea of mass, as the third dimension is entirely disregarded. On the other hand, a grouping based on the length of the greatest diameter is comparatively easy and while this excludes two dimensions, yet we feel that its greater opportunity for precision possibly balances the absence of the second measurement, and it certainly very greatly simplifies the counting. Therefore we at first adopted a grouping into four classes with average greatest diameter of .04 mm., .01., .004 mm. and .001 mm.; the diameter of the first four classes in the standard grouping will be 2.1, .02 and .01 mm., including much larger particles than our count and grouping our two smaller classes together as uncountable. While it is impossible to determine the area of these minute particles yet with proper dilution they are certainly countable. We grouped in our Class 4 all particles seen as mere dots too small to determine outline, and in our Class 3 minute particles too small to estimate area, yet showing definite form. Our tests show that these two classes together make up from 80 to 94 per cent of the total count in the average of different industries. In only nine instances in organic dusts did they together go below 80 per cent, in one case falling to 63 per cent, and in only five mineral dusts going below 80 per cent, the lowest being 74 per cent. As we have made 70 tests in all, 28 in mineral dusts in eleven factories in five industries, 37 in organic dusts in eleven factories in six industries, and five tests of non-industrial dusts, we feel that our results must be fairly representative. We have excluded the larger particles of Classes 1 and 2 of the standard method as they are usually too heavy to pass the nasal passages even if they do enter the nares, and, as the counts published by Palmer and his co-workers show, they never include more than 3 per cent of their counts and often none. Our four classes, while excluding the largest particles counted by Palmer, *et. al.*, include a wide range of sizes, our largest being forty times the diameter of the smallest as against twenty in their range, and, by having greater intervals between average sizes, facilitate grouping. Class 4 of standard methods corresponds with our Class 2 and that is where Palmer, Coleman and Ward[3] place most of their particles. Their total counts per cubic foot exceed the range of ours, ours ranging from 24,400 in the out-door air on a very quiet day, near an oiled road, to over 15,000,000 in a coal-crushing room of a cement factory, their range being 23,000 at the fifty-eighth floor of the Woolworth building and 48,000,000 in an iron-grinding room. We assume from this that they have not made as careful estimates of the smaller sizes, or have grouped all particles below .0001 sq. mm. and still countable in their Class 4. Our exclusion of larger particles facilitates the counting of fibrous dusts, and certainly long fibres are least likely to prove a factor in lung damage. Our tests were made with double distilled water filtered through a Berkefeld candle to exclude all suspended matter. To still further simplify counting, our Classes 2 and 3 might be grouped together, thus giving but three classes, Class 1 averaging .04 mm. in diameter and easily distinguished, Class 3 very minute visible but unmeasurable particles, and Class 2 all falling between these extremes, and we will use this latter grouping tentatively in future.

Table I gives a summary of our tests. Details of the tests in cigar factories have already been published[4] and the rest of the work appeared in a separate article.[5] The sizes of our classes are purely arbitrary and were originally based on a wrong reading of the article by Palmer, Coleman and Ward, but as they were found to work out so well in practice and as the work was started on that basis they were continued through the entire series of tests. Measurements made on a microphotograph of coal tend to confirm this relative size distribution.

We also deviated from Palmer's practice in the determination of solids, as it was found more convenient to evaporate to dryness 50 cc. of sample, usually representing 100 cubic feet of air, in a weighed porcelain capsule, cool in a dessicator, weigh, incinerate and again weigh and so determine total solids with percentage of mineral and organic matter. The residue from 50 cc. of double distilled filtered water is practically negligible and can be disregarded. We report our solids per 100 cubic feet, requiring no conversion factor.

CONCLUSIONS.

We would suggest, as the result of six months' work comprising seventy tests in a great variety of dusty atmospheres, that the standard method be modified by eliminating the two larger sized classes and counting Class 5 in one or two divisions which we feel are countable without great difficulty.

We would suggest that the sizes be based on the length of the greatest diameter rather than the area, as being much easier to determine and probably giving equally satisfactory results. The classes we have used are .04, .01, .004 and .001 mm., and those we suggest in future are .04, .004,–.01 and .001.

We would suggest the reporting of solids per 100 cubic feet rather than per million liters and the determination of percentage of mineral and organic matter therein.

With the above modification we find the Palmer apparatus used by the standard method gives reliable and valuable information as to the amount and character of the dust in the air.

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4. Smyth, H. F., and Miller, T. G. 1917. A Hygienic Survey of Cigar Manufacturing in Philadelphia, Medicine and Surgery, Vol. L., 698.

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TABLE I.

SUMMARY OF THE AVERAGES OF THE DUST TESTS WITH GENERAL AVERAGES FOR THE ORGANIC AND INORGANIC GROUPS AND FOR THE STANDARDS.

Industry	Number of Tests	Particles					Weight	
		Number per Cubic Foot	Percentage Distribution According to Size				Per 100 Cu. Ft. in Grams	Per cent Inorganic
			.04 mm.	.01 mm.	.004 mm.	.001 mm.		
Inorganic Group.								
Cement	11 (2)	6,790,900	3	11 (37)	26	60	0.2185	72
Flint	3 (2)	844,040	4	9 (31)	22	65	0.0459	76
Steel grinding	3 (2)	578,100	7	11 (28)	17	65	0.0483	96
Asbestos	6 (2)	494,130	4	11 (39)	28	57	0.0327	73
Pottery	5 (3)	182,720	5	10 (34)	24	61	0.0130	60
Average	28 (11)	1,777,970	4	11 (37)	26	59	0.0717	76
Organic Group.								
Blanket Plush and Carpet	13 (3)	148,950	11	8 (24)	16	65	0.0504	27
Felt hat	3 (1)	126,020	4	7 (33)	26	63	0.0168	39
Cigar	19 (6)	102,600	6	14 (47)	33	47	0.0085	56
Silk	2 (1)	87,000	3	7 (21)	14	76	0.0045	49
Average	37 (11)	116,190	6	9 (31)	22	63	0.0201	42
Standard Group.								
Location:								
Outdoor	2 (2)	34,000	3	8 (32)	24	65	0.0069	
Indoors	3 (2)	99,600	1	7 (29)	22	69	0.0114	66
Average	5 (4)	66,800	2	7 (29)	22	69	.0098	66

Note. Figures in parentheses in second column indicate number of factories. Figures in parentheses in percentage column give the results of combining the second and third groups as suggested.

CHLORINATION OF CHICAGO'S WATER SUPPLY.

JOHN ERICSON, C. E.,
City Engineer, Chicago, Ill.

To be read before the Sanitary Engineering Section, American Public Health Association, December 9–12, 1918, at Chicago, Ill.

CHICAGO has always been liberal in the quantity of water supplied her people and her varied industries. At the present time, notwithstanding continued efforts at conservation, necessitated by reason of unwarranted preventable leakage and waste, the amount of water supplied per capita and in total is greater than the amount supplied by any of the greater water works systems in the world.

There is an inexhaustible body of water close at hand, and the greater part of the city streets is less than twenty feet above the surface of the Lake. To the average non-technical mind no convincing reason has been recognized or accepted why the quantity of water supplied to the people should not be unlimited, and, therefore, the per capita, as well as the total quantity of water pumped at the city's pumping stations has steadily increased, the present daily per capita pumpage being about 260 gallons and the average daily pumpage from 638 to 740 million gallons, varying with the season and weather conditions.

SANITARY EFFORTS.

Efforts have continually been made by the municipality to safeguard the purity of the water supply, by locating intakes miles from shore and by the construction of intercepting sewers and the Sanitary District Channel, by which the flow of the sewage-laden Chicago River has been reversed, thus diverting the greatest part of the city's sewage away from Lake Michigan, the source of our water supply. Some portions just north and also the southern part of the city still discharge sewage-laden water into the Lake. Work is now in progress, however, under the direction of the Sanitary District of Chicago, which will also soon divert the sewage of these sections; on the north by the construction of intercepting sewers and a pumping station in the city of Evanston which will divert to the North Branch Channel, and on the south by the construction of the Calumet Sag Channel with necessary auxiliaries which will carry into the Main Drainage Channel the polluted waters from these districts.

The disposal of dredgings from the Chicago River into the Lake, as well as the navigation of large passenger steamers, will, however, be more or less a source of pollution as long as it exists.

The beaches along the shores of Lake Michigan are being used to a largely increasing extent for bathing purposes in the summer months. These and other reasons made apparent the necessity for further efforts towards the conserving of the purity of the water supply.

CHLORINATION.

Filtration of the Chicago water supply being a gigantic problem, treatment of the water by the hypochlorite of lime method was tried experimentally early in 1912 at the Edward F. Dunne intake crib, supplying the Roseland Pumping Station. In July, 1912, this treatment was extended to the 68th Street Crib, supplying the large pumping station located at 68th Street and Oglesby Avenue. In August, 1913, a similar experimental plant was also placed in operation at the Lake View Intake Crib.

Many difficulties were encountered with these installations. During cold weather the freezing of the solutions in tanks and pipes, the blocking up of the distribution pipes by anchor ice, and difficulty in the delivery of hypochlorite to the cribs caused periodical shut-downs of the plants. There were also many complaints by consumers on account of a disagreeable taste to the water.

LIQUID CHLORINE.

As liquid anhydrous chlorine had been used with apparent success in various places and apparatus for its use for water sterilization purposes had been developed to a point where the city was justified in taking up the matter seriously, an installation for trial and experimentation was made.

Two liquid chlorine apparatus, made up by using a modified acetylene gas reducing valve combination purchased from a Chicago manufacturer, were temporarily installed and connected to the intake of the 68th Street Crib. These apparatus were installed for the purpose of making tests of the feeding and regulation of dry chlorine gas, to secure data on the effect of temperature on the flow of gas, to test the effect of the gas on feed pipes and fittings of various materials, and to secure other valuable information.

The machines were operated by the regular employees of the crib under the direction of the City Engineer.

After this experimental work machines for the administration of liquid chlorine were installed in all of the city's pumping stations.

The dates on which the machines were placed in service at the various stations are as follows:

Chicago Avenue, September 6, 1916.
Twenty-second Street, December 15, 1915 (for temporary service, test and adjustment).
Twenty-second Street, January 4, 1916 (permanent).
Sixty-eighth Street, March 4, 1916 (temporary).
Sixty-eighth Street, July 1, 1916 (permanent).
Lake View, April 4, 1916.
Roseland, July 10, 1916.
Fourteenth Street, August 24, 1916.
Harrison Street, August 26, 1916.
Central Park Avenue, September 27, 1916.
Springfield Avenue, October 6, 1916.

The new equipment was comprised, with one or two exceptions, of the Electro Bleaching Gas Company's Model C, manually controlled apparatus, consisting essentially of manifolds to which the required number of cylinders may be connected, regulating and controlling valves, high and low pressure indicating gauges, a meter to indicate the rate of flow of chlorine gas, and a so-called absorption tower into which the chlorine gas and a small stream of water are introduced in such a way that the water will absorb the chlorine gas and flow to the point of application of either the common suction well of several pumping engines or the suction pipe of an individual engine.

The installation of the chlorine controlling apparatus in the different stations has been varied to suit local conditions. In general, each installation was placed in a well sealed half glass wooden booth or enclosure provided with heating coil or radiator and an indicating thermometer in order to maintain proper conditions of temperature and dryness.

An electric motor-driven ventilating fan with intake connected by copper suction pipe, with its opening near the floor of the booth, was installed in each place to remove the chlorine gas which might escape. The motor control switch was placed outside the booth to permit ventilation before the booth is entered.

The maintenance of this apparatus, with its many delicate devices, in proper service operation has been a difficult matter, notwithstanding all the precautions which have been taken to prevent leaks, breakdowns, etc. The regular station employees had to be slowly trained in the handling and care of the apparatus. When a man had become somewhat familiar with its use, call to war service or absence of such men on vacations made substitutes necessary, and this more or less aggravated the situation.

Chlorine gas is a very difficult substance to handle. Material of parts which pass through all tests under air, steam or water frequently proves porous or imperfect when subjected to chlorine gas. The city has been fortunate in having its own shops and foundry, which has enabled it to keep the apparatus in continuous operation, which would have been practically impossible if we had been obliged to depend entirely upon the manufacturer for repair service.

The apparatus now in use in the older stations is unquestionably capable of considerable improvements, particularly along lines which will eliminate numerous delicate parts, joints and valves, and that will give a more dependable distribution of the amount of chlorine to be fed to the water.

A step in this direction has been taken by the city in connection with the new Mayfair Pumping Station, located in the northwestern part of the city, and which was placed in service in August of this year.

This station contains five triple expansion pumping engines of the plunger type with a combined capacity of 110 million gallons per day. The ultimate capacity of the station will be about 152 million gallons.

The water is supplied to these pumps through a tunnel with the intake three miles from shore. From the main shaft at the pumping station, which is located five miles west of the lake shore, the water is distributed to the pumps through two branch tunnels connecting at a higher elevation with the main shaft located in front of the station.

Thus all the water which is pumped at the Mayfair Pumping Station has to come up through this main shaft, and it was selected as the most suitable and effective point to apply the chlorination. The pipes conducting the chlorine solution into the water as it rises from the tunnel through the main shaft extend fifty-five feet below the horizontal branch tunnels, thus giving the chlorine as much time as practicable to act on the water before it enters the pumps.

The chlorine apparatus of the Mayfair Station consists of two complete and independent sets, so that in case or a breakdown of one of them the other may be thrown into use very quickly.

Each unit consists of a group of a battery of nine (9) chlorine cylinders connected with suitable tubing to the manifold receiver where the pressures from the various chlorine cylinders are equalized. From this manifold receiver the gaseous chlorine passes into a so-called *Ærisostat*, a chamber that regulates the quantity of chlorine required and wherein the pressure is reduced sufficiently to just drive the chlorine gas through the wrought iron piping into a room constructed over the main shaft and the floor of which is seven feet above low lake level.

In this room are situated two sets of two mixing towers providing for the reception of four $\frac{3}{4}$-inch chlorine pipes. These mixing towers are seven feet high and are filled with pumice stone; they are made of hard rubber and are eight inches in diameter. One of the chlorine pipes enters each mixing tower from the top and extends to within six inches of the bottom. It is covered with a copper spraying cone into which during operation a stream of filtered water falls, which, by gravity, works down through the pumice stone in the mixing tower. The chlorine gas in rising in this same enclosure is absorbed by the water, thus forming the real chlorinating solution.

From the bottom of the mixing tower extends a hard rubber pipe one inch in diameter connected to a $1\frac{1}{4}$-inch inside diameter rubber hose through which the chlorine solution finds its way into the raw water at about an elevation of ninety feet below low lake level or datum. This hose is protected by a two-inch extra heavy galvanized iron pipe anchored to the walls of the shaft. This describes in a very brief and general way how the chlorine is administered to the raw water.

The regulating and pressure reducing part of the apparatus called the *Ærisostat* differs in principle from the other installations. It is simple and compact, and from months of trial it promises to greatly reduce the cost of maintenance and to insure a more accurate distribution of the chlorine gas.

A detail description of this apparatus cannot be taken into consideration in the scope of this paper, but the general principles on which it is designed are as follows:

The chlorine regulator or *Ærisostat* is essentially low pressure float-controlled chambers, based on the principle of a U-tube with legs of different areas proportioned to equalize the effect of the higher pressure of the chlorine cylinders and the low pressure required for the delivery of the gas to the absorption tower or other point of delivery.

The main chamber of the regulator is divided into two parts of proportionate areas by a partition extending downwards to within a certain distance of the bottom. This chamber is nearly filled with pure sulphuric acid. Chlorine gas from the cylinders is admitted to a circular opening in the top of the chamber, the underside of which opening forms a seat for a vertical needle valve. As soon as gas is admitted through this valve into the larger part of the chamber the pressure of the gas upon the sulphuric acid in the larger chamber forces the liquid up into the smaller one. A float in this chamber is connected to the vertical needle valve by levers and rods in such a manner that it controls the opening and closing of the valve, as the pressure of the gas causes the fluid to rise or fall in the smaller chamber. This regulation in the older apparatus is obtained by two or more frail reducing valves of the diaphragm type with counter acting springs. These required close watching and attention to keep the same in operating condition.

The chlorine platforms and accessories are enclosed in partitions of steel and glass, isolating the installation from the pump room. An electrically operated exhaust fan ventilates the enclosure driving the exhaust air out through an opening in the roof of the gate shaft. A red pilot light indicates from a distance when the fan is operating. The ventilating conduit is a six-inch diameter No. 16 gauge copper pipe. Provision for heating has been made so as to keep the temperature within the enclosure between 90° and 95° F., and in the main shaft the temperature should not go below freezing point. The temperature is controlled by thermostats.

It is important that the amount of chlorine used be accurately determined, and as a check on the distributing apparatus two dial reading chlorine weight indicators are installed. The weighing platforms are inside the enclosure, but indicators are placed outside. The pointers are so arranged as to show directly the number of pounds of chlorine used. The recording gauges showing the pumpage of the water, as well as those showing the dosing by chlorine, give an accurate account of the proportion of chlorine used to the water pumped. It would, however, be far more desirable if a satisfactory means can be introduced which will automatically regulate the amount of gas used in a definite proportion to the pumpage. This seems feasible with a Venturi meter when used to record the flow of water, as it may be connected to the apparatus controlling the flow of chlorine automatically increasing the flow of gas as the pumpage increases, and vice versa. This problem will be given attention.

The most modern apparatus and all improvements which past installations have suggested are made use of at the Mayfair Station.

It would seem, however, that considerably more experimental work will have to be done with the mechanical devices and that the analyses of the chemical activities of the gas be made as may be required under various conditions. A special study of the chlorine plant at this station will be made with a view of future improvements.

Chlorination for the sterilization of water for domestic purposes is evidently a correct principle, judging by our experience so far. The results obtained in Chicago since complete chlorination has been in vogue seem to bear this out.

The bacteriological tests made on untreated water during 1916 showed colon present in one cc. in 18 samples out of 1,000 examined, whereas the corresponding number of contaminated samples in treated water during the first nine months of 1917 was nine-tenths or less than one per 1,000 samples examined.

During the first nine months following complete chlorination of the water supply the death-rate from typhoid fever was reduced by 71.44 per cent. There is, therefore, a strong indication that the use of chlorine reduced the death-rate due to typhoid fever more than 70 per cent.

It is our duty, however, to further investigate and to experiment intelligently and scientifically for the purpose of constantly improving our methods with a view of providing mankind with a pure and wholesome water free from injurious substances.

The Department of Health is exercising a close supervision over the chlorination of the water supply in Chicago, and to this supervision can to a large extent be ascribed the gratifying results obtained.

I have taken it for granted that some representative of the Health Department will furnish you with detail statistics illustrating more fully these results.

BIRTH REGISTRATION IN CONNECTICUT.

James P. Balfe,
Director, Bureau of Vital Statistics, State Department of Health, Hartford, Conn.

To be read before the Vital Statistics Section, American Public Health Association, December 9–12, 1918, at Chicago.

THE development of birth registration in Connecticut is of peculiar interest because this commonwealth was among the first to recognize the importance of the subject and to enact legislation covering it. As early as 1644, it was "ordered that the Town Clarkes or Registrars in the seueral townes within his jurisdiction, shall ech of them keepe a record of the day of mariedge of euery person maried w'thin theise libertyes, and of the day of the birth of euery child hereafter borne, to who the parent of the child shall w'thin three days after the birth of his child certifie the day of the child's birth, and to who euery man that shall be maried shall w'thin three days after his mariedge certifie his mariedge day under the penalty of five shillings euery default."

Not sufficient record or statistics are now available by which we can judge the success which attended this pioneer effort to make birth registration compulsory. It is notable, however, that this crude law put the burden of registration upon the parent.

During the period of nearly three hundred years since those Colonial days, laws relating to this subject have been continuously a part of the statutes of Connecticut. That none of them has been completely satisfactory is evidenced by the fact that there have been frequent amendments to the law, most of which relate to the methods by which the desired information was to be secured and recorded.

In 1848, Connecticut published its first report on vital statistics. Since then, with the exception of the year 1852, annual statements on the subject have been printed by the state. In the Acts of 1852 it was provided that every town at its every annual meeting appoint a registrar, who was required to keep a record of vital statistics and, once a year, to send abstracts to the Secretary of State, by whom they were published. In 1854, the General Assembly directed the State Librarian to make a report relating to births, marriages and deaths.

In his annual report for 1863, the State Librarian wrote: "The value of a thorough registration will be felt now more than ever in consequence of the war, not only in settlement cases, but in applications for pensions and bounty lands by the widows and orphans of those who are laying down their lives in efforts to maintain the laws of the land and the unity of our country; and, as the Secretary of Rhode Island remarks, had our present system of registration of births, marriages and deaths been in operation during the War of the Revolution and that of 1812, some hundreds of thousands of dollars would have been saved to the people of this state, and hundreds of families, which for years struggled with adversity, would have been made comfortable during their lives."

It might appear from this quotation that the system in vogue at that time approached perfection. Nevertheless, when the State Board of Health was organized in 1878 and the Secretary of the Board made Superintendent of Vital Statistics, it was found that many towns made no returns whatever. In some instances registrars had not been appointed and there were no officials to collect and record the necessary data. Dr. Chamberlain, the first secretary of the Board of Health, made every effort to improve conditions; but he discovered that no adequate means had been provided for the enforcement of the law. It was nobody's duty to see that it was obeyed. The following quotation from one of Dr. Chamberlain's early reports sounds strangely familiar to one who follows the present nationwide agitation for complete birth registration:

"The town registrar might treat a return which omits to give information on the points required as a nullity and proceed to collect the information himself and receive the fee therefor. Although it is made the duty of registrars to amend their records from time to time, this is done to but a small extent, however well-disposed the registrar may be. In places where he cannot be personally acquainted with all the families residing in his town, it is impracticable to obtain the names without a thorough canvass of the town. Some method certainly ought to be devised to remedy this defect which will seriously impair the future value of these records.

"The importance of complete registration in regard to all questions of heredity and descent are too obvious to need comment; and the value of such records increases as the country grows older and other sources of information less readily obtainable. That the births are not all recorded requires only a glance at the comparative population and birth-rates of our cities and towns. The relations of complete registration to claims for pensions, legal settlements, annuities and insurance are too extensive to be more than hinted at in this connection. The laws of the state are such that it only requires individual effort to secure better registration than any other state in the Union."

And this was written in 1878!

In 1893 the legislature passed an act providing for the appointment of a county health officer in each of the eight counties of the state. It was stipulated that each health officer should be an attorney-at-law, and he was empowered to cause the execution of the laws relating to public health and the registration of vital statistics. It was believed that their training and experience would enable them to appreciate the value of correct records and to maintain a systematic inspection of the conditions of registration in all towns. These expectations were not realized. Public indifference and the negligence and, often, the open contempt of professional attendants had the usual tendency to discourage zealous officials.

New legislation in 1917 abolished the State Board of Health and created the State Department of Health. The executive officer of this department is the Health Commissioner. Acting under him are various directors, each vested with full authority and responsibility in his particular branch of the work. All matters relating to the registration of births, marriages and deaths come under the immediate supervision of the Director of Vital Statistics. This functionary is concerned with no other work of the department; and it is believed that by thus centralizing the authority and duties necessary for this work much better results may be obtained than seems possible where the responsibility is divided or the work made incidental to other duties.

Our present statute governing the collection of vital statistics requires every physician or midwife who shall have professional charge of a mother at the birth of any child, and every person who shall act as midwife at such a time, when no physician is employed, to file with the town registrar five days after the event occurs, a certificate of birth, signed by such physician, midwife or attendant; and it further specifies the information which such certificate must contain. The same statute constitutes the town registrar the custodian of all vital records, and, in cases where the attendant fails to file a certificate of birth, the registrar is directed to secure the information himself. On or before the fifteenth day of every month, he is required to send to the State Department of Health an attested copy of every birth certificate filed with him during the next preceding month. The law carries a penalty of not more than $25 and not less than $7.

A recent survey of birth registration in Connecticut, conducted by the United States Census Bureau, under the direction of Dr. W. H. Davis, Chief Statistician of Vital Statistics, shows that a trifle more than 90 per cent of the births in the state are being reported. The tests of rural districts proved practically perfect, the deficiency occurring in the larger communities. In the most populous city of the state, it appears that fully 12 per cent of the births are not registered. This is accounted for by the fact that in our great industrial centers the percentage of foreign-born residents is very high. Among the Slavs and Italians it is common to dispense with the services of a professional attendant at childbirth. When the event is about to occur they call in an unlicensed woman who not only assists the mother at the birth, but also takes full charge of the household until the mother is up and around, receiving a very modest fee for her work. It has been established that about 85 per cent of our unreported births result from this custom. The attendant will not report for fear of prosecution for practising without a license, and the parent is reluctant to report through fear of involving the attendant.

No provision is made for reporting births where professional attendance is lacking, other than the statutory requirement that registrars must ascertain all births occurring within their towns. In the larger towns, it is impracticable to expect the registrar to ascertain births except where obtained from the churches. The registrars of some towns are furnished lists of baptisms which have resulted in many hundreds of births being added to the records. The town registrars, almost without exception, fully realize the great importance of perfect birth registration, and considering the slight financial and moral support which they receive, this paper would not be complete without appreciative comment being made of their service.

A remedy for this condition might be found in an amendment to the law requiring the parent to file the certificate in the absence of a professional attendant and providing a penalty drastic enough to command respect.

Such an amendment will be proposed at our next General Assembly.

Another apparent defect in our statutes is the provision that all action on complaints for violations of the Vital Statistics law must originate with the county health officers. This places upon these officials an unnecessary and distasteful burden. Such a condition is always undesirable. It is my opinion that prosecutions should be handled by the State Department of Health through a State Prosecutor, acting upon complaint of the Director of Vital Statistics, who is the one official most interested in the correct and complete compilation of birth records. At the present time, when this official becomes cognizant of a violation of the law, he can go no further than to call the matter to the attention of the county health officer. The disadvantages of such a system are too obvious for comment. On the other hand, it is easy to visualize the moral effect, on chronic violators, of prosecution by an official who represents the impersonal and impartial power and authority of the commonwealth itself. As Frederic Bastiat, the great French publicist, once said, "the way to make a law respected is to make it respectable."

One of the chief difficulties of correct birth registration in Connecticut grows out of the cosmopolitan character of the state's population. Our great manufacturing industries attract labor of all nationalities. Many of our residents possess names which defy and humiliate the rules of English orthography. Where the parents are illiterate, the confusion of the professional attendant attempting to write out a birth certificate can be better imagined than described. In the case of many Slavic names, it would appear impossible ever to spell them phonetically without adding to our alphabet new characters representing a cough, a sneeze and a hiccough. Although our physicians and licensed midwives now rarely fail to file certificates of birth, it appears that they are frequently careless in the matter of spelling names. The tremendous demand for certified copies of birth certificates occasioned by the war and by legislation concerning child-labor, etc., has brought out the fact that about 35 per cent of all certificates thus requested have required correction.

With a view to stimulate better reporting, and to securing greater accuracy in the spelling of names, the Department of Health has recently adopted the plan of sending to each mother an engraved record of her child's birth, signed in facsimile by the Governor of the State, Hon. Marcus H. Holcomb, and the Health Commissioner, Dr. John T. Black. It contains the child's name, the place and date of birth, the father's name and the mother's maiden name. This is sent as soon as the birth has been certified to the department by the town registrar. Accompanying it is a request that if the names and data are incorrect, the department be notified immediately and the corrections will be made. The plan has been adopted too recently for us to judge its effectiveness, but it is hoped that it will reduce the errors in our permanent records as well as incite greater care on the part of those charged with the duty of filing the original certificates. It is also hoped that a general demand may be created for the little record itself.

From this brief outline of the general conditions surrounding birth registration in Connecticut, it will be seen that the difficulties and problems presented to our state authorities are not unlike those encountered elsewhere. While our legislation on the subject is not perfect, it is well to consider that laws themselves have their own limitations. After all, the great governing power of our time is public sentiment. A law deprived of that power becomes a dead letter. Backed by it, an imperfect law may secure practically perfect results. Complete registration will never be secured until the demand for birth certificates becomes universal. The only incentive which will create such a demand is general recognition of the value of these certificates. When every parent understands the dangers arising from lack of registration, it may reasonably be expected that the results will be as nearly perfect as is humanly possible. It is this thought which has led our Department of Health to institute a thorough campaign of publicity with a view to impressing every parent with the idea that one of the first legal rights of a new-born child is to have a certificate of his birth properly executed, filed and preserved.

A paper of this character is naturally made up largely of individual opinion and experience; but it will bring before this body the fact that Connecticut is fully alive to the necessity as well as the advantages of complete and accurate birth registration. It requires such stirring times as the present to bring home to us the realization that each individual citizen represents a national asset and that the protection of his rights from infancy is as much a matter of sound business policy on the part of the state as it is a duty to the child himself.

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Statistics of Syphilis.—It appears from the figures in the following table that the usual estimates of the prevalence of syphilis (from 1 to 3 per cent) based on clinical methods of diagnosis are erroneous. Wassermann tests given to representative groups in a routine manner reveal that the per cent infected varies from 2 to 5 per cent among men students, 8 to 11 per cent among white workingmen, and from 15 to 20 per cent among the lower classes of whites and among negroes.

THE PREVALENCE OF SYPHILIS AS INDICATED BY RESULTS OF MEDICAL EXAMINATIONS OF EMPLOYEES, STUDENTS, ARMY RECRUITS AND OTHER REPRESENTATIVE GROUPS.

(Diagnosis based on Wassermann tests administered to all cases in regular routine or to individuals selected at random.)

	Number	Infected with Syphilis Number	Infected with Syphilis Per cent.
Cadets in West Point; males only (Vedder)	621	34	5.5
Students in University of Texas Medical School; males (McNeil)	50	..	0.0
Applicants for push-cart licenses examined by New York City Department of Health	1,117	91	8.4
Men in Tombs Prison (New York City) examined by New York City Department of Health	446	49	10.9
White recruits in U. S. Army (Vedder). Accepted recruits (no cases of known syphilis included, as all such cases discovered by examining physician by use of clinical methods had been rejected before tests were made)	1,019	171	16.8
All applicants (2.3 per cent rejected at recruiting stations because of diagnosis by clinical methods added to above; estimate by Vedder)	..	..	18.9
"Apparently healthy negroes" under treatment chiefly for accidents, Galveston, Texas (McNeil)	200	46	24.0
English workmen of "a somewhat superior artisan class" applying for positions requiring medical examination; adult males	500	46	9.2
Workmen treated in East London Hospital for accidents, wounds, etc., some friends visiting patients also included; all apparently healthy	1,002	84	8.3
Males	616	64	10.3
Females	386	20	5.1

—H. H. Hibbs, Jr., *Trans. VIII, Annual Meeting Amer. Ass'n for Study and Prevention of Infant Mortality*, 1917, p. 121.

(D. G.)

REPORT OF THE COMMITTEE ON PRODUCTION AND CONSERVATION OF FOOD SUPPLIES.

To be read before the Food and Drugs Section, American Public Health Association, December 9–12, 1918, at Chicago, Ill.

WITH the constant energies of the Food Control Commissions of the several countries of the Allies being applied, and with the results of the labors of their recent extended joint Conference in London, it may seem almost superfluous for the Section on Foods and Drugs of the American Public Health Association to concern itself with such problems as the Conservation and Production of Foods.

It is something, however, to have had a section, which may be called a standing committee of the Association, to bring together such a symposium of scientific papers as were presented in Washington last year, and there can be no doubt but that this year again the main factors of the problem will be illustrated and its solution thereby advanced.

Essentially it is a problem always and first of increased production and of increased conservation of food. The Food Commission tells us that the saving of the consumption of wheat in the United States sent 85,000,000 bushels more to the Allies last year, or enough to feed an army of 1,000,000 men. We further learn that 10 per cent more winter wheat was sown in the autumn of 1917 in the United States, while Ontario in Canada had an acreage of 10,000,000 in grain in 1918, and the total increase of crop area in Canada in 1918 was 6,000,000 acres. England, France, and Italy all increased their crop acreage in 1918, and the British Prime Minister has stated that the spectre of famine in Allied countries has been laid.

Should it, however, seem to some that the food problems have been solved, it may be worth while referring to the fact, that for the great bulk of the workers in our communities at home, holding positions where wages are largely stationary, the incentive of increased fixed prices in aiding greater production has resulted in a situation which affects the nutrition of a large number of the children in cities in ways which can, even if measured by an infant death-rate, be but imperfectly estimated, since the effects will be extended into the growing years of hundreds of thousands of the children not only of the Allies in Europe, but of non-combatants in America. This may be illustrated by such facts as that stated with apparent authority, that in New York State, while usually there are about 17 per cent of the milch cows slaughtered annually, 31 per cent were slaughtered in 1916–1917. The Advisory Committee of Congress in May, 1918, further reported 2 per cent less total live stock in the United States in 1917, 20 per cent less hogs in Iowa and 3 per cent less milch cows.

Yet alongside this the statement (from a British trade paper) to the effect that there was such a glut of bacon in the Liverpool docks when 10,000 tons arrived in April for which there were insufficient cold storage facilities, that thousands of tons so deteriorated that they went to the soap factories, while the balance was recured with boracic and smoked. As a partial defence for this situation 'The Times' intimated that the real difficulty lay in the lack of cold storage on ships. From the action taken by Allied Governments to regulate warehouses and cold storages by requiring monthly reports for the amount of produce on hand, it is evident that in the old methods of competitive transportation and storage we find one of the most serious problems, which in peace time as in war must be solved by common understanding or coöperation.

Hoarding to maintain high prices, if associated with decline in quality, has all the evil effects of waste through neglect to preserve perishable products, with the further ethical sin of selfishness to maintain abnormally high prices. It is equally apparent that the many millions of farm products forced upon the market through lack of facilities for their conservation through cold storage, drying or canning, may have so often depressed prices as to result in there being no profit whatever to the producer.

The loss of bacon at Liverpool has been already referred to, yet it may be further stated that £130,000,000 was the value of foods in cold storage annually in England before the war occurred. Nevertheless frequent losses even then resulted from insufficient cold storage and refrigerator cars, as seen from the fact that there were even in 1918 only 2,000 refrigerator cars in Great Britain of but five tons capacity each. The organization of the Ministry of Food in England has been, however, of much value in distributing food. Every town goes by a number and has a call indicator and central office in which is entered daily the amount of each commodity then for sale. There are six districts in Great Britain each having a daily code indicating the food available in the district. The amounts are sent to the central office by 11 a. m. daily, so that space for the same in the war area can be arranged for.

A rather remarkable illustration of the influence of the organized wholesale dealers in foods, as cold storage men, shipping companies, forwarders abroad, etc., is seen in the fact that the Director of Ministry of Foods in England has stated that the great corporations determined the policy of the Department and opposed the creation of great cold storages at Liverpool and Glasgow, on the ground that, after as before the war, the various shipping companies would have cargoes arrive at the various seaports of the east as well as the west coasts and that an expenditure of capital in new warehouses would seriously affect these existing interests.

While such illustrations as that just given indicate the influence which organized trade has had, and still has, over production and conservation of foods, yet the activities of Governments as that of the Ministry of Food in England and that of the appointment of Food Controllers in the United States and in Canada, and their action in the matter of taking over the control of packing houses, of the distribution of various classes of foods, and of regulating the use of various food materials, all indicate the essential need that exists always, but is accentuated in war time, for not only the intelligent investigation of the problem by national Food Controllers throughout the world, but also the application of the knowledge thus gained to attain the most desired end, namely the production and conservation of those classes of foods most essential for the development and maintenance of human life.

It is apparent that the suggestion of any such scheme would in peace time have been looked upon as largely quixotic in the modern world, where competition has been deified as the only object of worship in trade worthy of general consideration. If, however, the world war is to teach the nations anything, then it becomes apparent that something better than the *laissez faire* pre-war system of trade competition ought to be the outcome of the infinite strain borne by millions of the human race struggling for subsistence. If it is possible for the members of the Food Boards to sit together in London and calmly discuss the means by which adequate quantities of the proper foods can be supplied where needed to all the nations of the Allies, it ought surely to be possible in time of peace for such nations to continue the goodwill and coöperation so established in the interests of the hundreds of millions of their wage-earners and consumers including the soldiers who have been fighting for their liberties.

The more the outcome of the combined energies of the Allied nations is studied and investigated, the more apparent does it become that human energy, intelligently and scientifically applied, is more than sufficient to produce with the favoring influences of sunshine and climate, food enough and to spare for all the dwellers on the earth. Taking our own continent as an illustration, we see how at the time when the proportion of urban population to the total was not more than 15 per cent and when cargoes to a country only three thousand miles away were carried on slow-sailing ships, such calamities as the Irish famine of 1845–7 were always within the range of possibilities. On the other hand we see today that with millions of men removed from production to the ranks of the army and with urban population making up more than one-half the total population, intelligence and energy by utilizing machinery is producing such enormous crops as even to make it possible for the Premier of Great Britain to say that industrial England can this year supply two thirds of her own food needs.

When viewed closely, however, the complexity of agricultural and industrial development in connection with the world trade appears to grow greater with every year, along with ever-increasing diversity of occupation and ever-growing opportunities for the investment of capital, which we may call the surplus product of labor. We are told, for instance, that machinery is increasing the possibilities of agricultural production by at least five times. This is associated directly with the fact of the enormous influx of rural and immigrant population to our cities to engage in all the diverse industries which modern civilization has brought about. What is apparent, however, is that the close relationship between these two facts is only slowly being recognized; while the industrial interdependence between the producer of food and the consumer and the essential need for national and international energies being devoted to these ends is apparent.

The first stage to this end manifestly is the application of scientific experimental methods to every agency involved in agricultural production, followed by the preparation of raw products for food, both in the matter of their conservation and their cheap transportation. Probably no better illustration of this can be given than the recent practice of the strawberry growers and jam manufacturers of the Southern States in treating the surplus strawberries on the plantation with an equal weight of sugar and then loading them on refrigerator cars when they are sent to a cold storage until needed by the factory. If the capacity for production is being so greatly increased, then it does seem evident that the necessity for the long hours of labor, which farming has demanded in the past, ought to be notably lessened thereby supplying leisure and opportunity for the cultivation of more social amenities on the part of the agriculturist.

When, however, it is realized that it is not more than fifty years since slavery was abolished in Russia and that in many of the continental states of Europe even today, the rights of the peasantry have been of the most nominal character when compared with the advantages held by the landowners, and when we see in America the great body of immigrants, without capital yet with abundant land to cultivate, while greatly improving their past position, still remaining largely isolated in their communities and unable to take advantage commercially of the results of their labors through the proper marketing of their products, it must become apparent that the problem of food production, distribution, and consumption in the best interests of every member of the community will continue to remain after the war a problem very far from final solution.

Some idea of what is being accomplished may, however, be gained from various illustrations. In Sweden during the past thirty years associations have been formed for coöperation and are known as the National Union of Provincial Societies and Local Associations. There are over one thousand *locals* which receive orders and conclude transactions either directly with traders or through the National Union. The fundamental principle is the supply of goods at the market price of the day and the distribution of the profits among the purchasers of each. Later almost all the needs of the farmers have been supplied through such associations while all the technical facilities of modern agriculture are similarly placed at the disposal of the growers with technical help, especially to small farmers in producing and marketing their products. With the lessened number of laborers there has resulted an increased wage rate and an increase in the use of machinery. Unfortunately, too, the cost of production has exceeded the proportionate increase in the price of products, which naturally is regulated by competition in world markets with produce elsewhere.

It is interesting to note that some of these socialized methods of assisting production by assisting agriculturists on this continent are seen in Federal legislation at Washington for Farm Credits establishing banks, as well as in several Provinces of Canada, while Canada has passed an act to inspect and regulate stock yards. In California, in 1915, legislation was passed to develop and regulate the state-marketing of products. An officer of markets and organization was appointed by the State whose duties especially include the investigation of:

1. Demand, prices, and amount in value of crops and the amount of cold storage.
2. Methods of coöperation, organization and relations between producer, consumer, and distributor.
3. Gradual establishing of standards as to quality, methods of handling, etc.
4. Investigating the practices of commission men.
5. Survey of quantity, quality, and value of products for owners.
6. Sending out advice as to points of distribution.
7. Improving the extent of this distribution and sale of farm products.
8. Reducing the cost of production, lessening the price to the consumer, and increasing the value to the producer.
9. Cultivating an interest in the coöperation of the three interests, producer, commission man and consumer.

But while we naturally direct our attention to the great problems of the production and distribution of foods, such as wheat and other staples, yet the application of those biological processes, based especially on the knowledge gained through the labors of Pasteur, Toussaint and others as chemists and bacteriologists must appeal with peculiar force to the Food and Drugs Section of a scientific association such as this. A single illustration has already been given of how the strawberry, one of the most delicious yet most perishable of fruits, is made available for consumption in the most distant markets by the application of the two processes of cold storage and canning. Today both these are being applied directly to the conservation of those other most perishable but essential foods, milk and eggs. Cold enables such to be taken to the factory where sterilizing or drying both serve to make them available as food for ships, at the war front or in the lumber or mining camps in regions far distant from the source of supply.

As regards the supply of fish, nothing has been more remarkable than the development especially on this continent of the fish industry since the war, only made possible since cold storage and canning processes have been evolved. The papers presented in this section last year were full of interest, pointing out how during the decade of 1900–1909 the fish-canning industry on this continent increased much less then any other canning industry. It has needed an actual dearth of meats through war to teach us the value of fish products and to develop the methods for their distribution. When we learn that frozen halibut from Alaska and British Columbia are reaching the markets of the East of England, and the troops in France, we can understand how the harvest of the seas is at our disposal, so soon as we avail ourselves of scientific means for its conservation. It seems no unlikely dream to expect, instead of ships going to the Arctic and Subarctic laden with food for exploration parties, that we may some day see the eggs of great flocks of sea-birds being collected, their contents concentrated and cargoes brought to the world's markets in cold storage, just as we have eggs from China sterilized and put on the markets.

But one more reference need be made and that is to the increasing use of the oldest conserving process, that of drying and smoking, which reaches back into the centuries and was utilized by savage tribes during uncounted ages. Seeing its value and early to take advantage of it for economic war purposes, Germany had in 1914 over 988 factories for drying potatoes. By these 30,000,000 tons of raw potatoes produced 12,000,000 tons of dried product containing about 17 per cent of moisture. Such is used not only in the usual way as food for men, but further is dried for flour, and is supplied as food for horses and cattle in cubes and flakes. Centrifugal machines are capable of drying from one to five tons per hour at a cost of from six to eight cents per one hundred pounds of dried product.

But enough has been indicated by your Committee to make it evident that the food problem is a most complex one, that in the past its solution has almost wholly depended upon accident due to ignorance, custom and defective means of transportation; that in modern times it has become the hand-maid of steamship and railway development by which the commerce of the seas has been increasingly associated with the railway extension, which again through its land grants has determined the direction of immigration and with its increase the enormous expansion of the growth of wheat and of cattle on the wide prairies and pampas of America, the steppes of Siberia, and the plains of Australia.

British industry since Toussaint's first ship to LaPlata in 1880, fitted with refrigeration, has increasingly been fed with chilled beef and bacon from America and frozen mutton from Australia; while the home-fed beef from the pastures of the midlands, and highlands mutton from the Grampians, has become the choice food only of the well-to-do.

During the same period roller-process flour has been robbing even the cheap prairie wheat of its wholesome vitamines, thereby greatly affecting the growth of our children, while Minnesota millers have become multi-millionaires. Thus the wonderful progress of Science, whose victories have been seized by the captains of industry, has not been without its fly-in-the-ointment; but if the outcome of the demands and turmoil of war should lead to a better knowledge of the almost limitless bountifulness of Nature in her varieties and kinds of food, to a more intelligent use of those most essential to growth and development and to a more careful selection of those whose food values are most closely in keeping with their money value; and if above all the people everywhere will exercise the impelling will of a free democracy, through legislation, to promote the freest distribution of world products and the careful equalization of profits between the producer and consumer, then we may yet live to see the outcome of the war as not wholly evil, but even a blessing to those who come after us.

William A. Taylor, M. D.,
Prof. Curtis M. Hilliard,
Irvin S. Osborn,
Prof. Wilfrid Sadler,
Peter H. Bryce, M. D., *Chairman.*
Committee on Conservation and Development of Food Supplies.

DON'T DRINK SHIPS!

U. S. Food Administration.

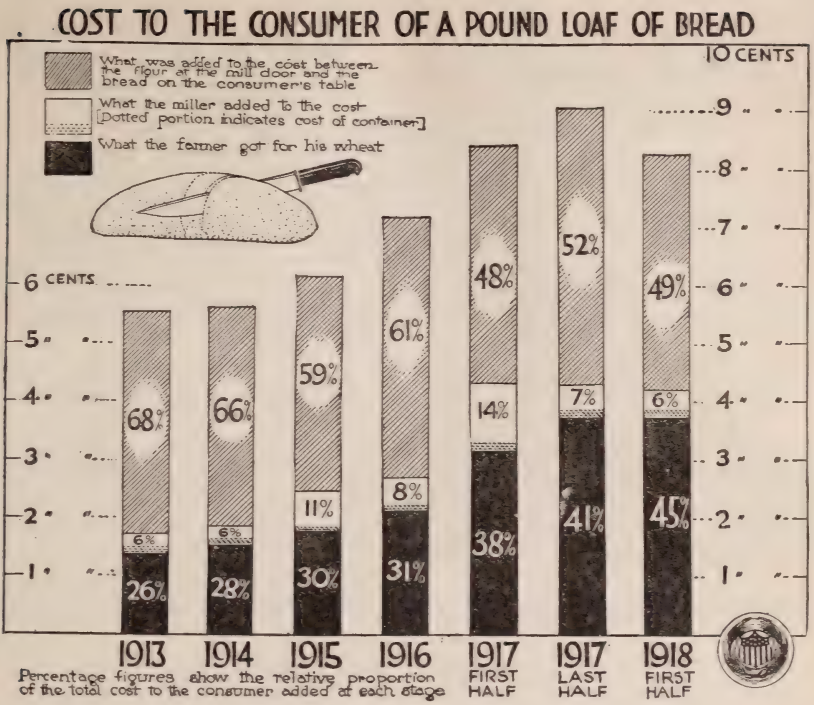
Are you shocked to see the lady drinking ships?

You drink ships every time you use sugar unnecessarily, in a beverage.

Seventy-five per cent. of the sugar used in this country has to be brought here in ships. Every possible ship is needed for the transportation of troops and supplies to the other side.

Eliminate sugar as a luxury, and you release many ships for war purposes.

Teach your appetite to remember this—
DON'T DRINK SHIPS.



U. S. FOOD ADMINISTRATION,
WASHINGTON, D. C.

Cost to the Consumer of a Pound Loaf of Bread
(EXPLANATION OF CHART)

Since 1913 farmers have been receiving for their wheat a gradually increasing proportion of the price paid by the consumer for bread. The amount received by the wheat grower for his contribution to the average pound has increased from less than 1½ cents per loaf in 1913 to more than 3½ cents early this year. The proportion to the whole price is shown by the relative length of the black columns of the chart.

The middle portion of each column shows what the miller received for his milling costs and profit. This has been a somewhat variable factor, but is now at the minimum (6 per cent). In this 6 per cent, however, is included the cost of the containers (bags, sacks, etc.) shown as dotted area which has increased very nearly in proportion to the price of bread itself. Bags now cost about 50 per cent more than in 1913 and 1914.

The shaded portion of the column represents the expense of distributing the flour, making it into bread and getting the loaf to the consumer.

The chart shows that the farmer is now receiving a much larger share of the final price for his product than in the past, and that a considerable amount of "spread" has been taken out of other expenses.

*

Control of Meningitis.—Simon Flexner emphasizes the importance of the carrier question in the fight against meningitis, especially in our new army. Two essential facts appear: first, that numbers of meningococci are thrown off with the naso-pharyngeal secretion, and second, that the bacteriologic type or variety of the organism plays a large part in determining the result. Thus the healthy carrier who harbors many meningococci is a much greater potential menace than one who harbors few. Bacteriologists are agreed that the meningococci are a complex group rather than any fixed type of microorganism. Recent studies also indicate that this group contains two immunologic varieties which are responsible for from 75 to 80 per cent of all cases of epidemic meningitis. The rest of the cases are caused by meningococci of less fixed qualities, and also less parasitic. The healthy carriers have been found to harbor rather the less pathogenic varieties, but once cases become frequent the number of healthy parasitic carriers increases. We now can tentatively view the meningococci as we do the pneumococci and assume that there are miscellaneous meningococci corresponding to the Type IV class of the pneumococcus which is still regarded as saprophytic, and practically always present in the mouths of a large proportion of healthy persons. If we continue in this line of comparison we should regard as menacing only the carriers of the parasitic varieties.—Flexner, S., *Journal A. M. A.*, Aug. 24, 1918, p. 638. (*D. G.*)

EDITORIAL SECTION

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THE ANNUAL MEETING POSTPONED.

The postponement of the annual meeting from October 14–17 to December 9–12 came to many of our members as a keen disappointment.

When it became apparent that influenza threatened to interfere with the meeting, the secretary communicated with the members of the Executive Committee and a meeting was held in New York City, October 5.

The proper course of action was not clearly indicated. The Central States, from which about three-fourths of the total attendance was expected, strongly favored the holding of the meeting; the local committees at Chicago had been busy with preparations for months; about a half-dozen other societies had coördinated themselves with the meeting of the American Public Health Association; advance notices had been sent to all parts of the country over the wires of the press bureaus; many scientific and commercial organizations had made arrangements to send exhibits; the state health officers of the upper Mississippi Valley had sent several thousand letters to local health officials advertising the date of the meeting and urging attendance.

Postponement of the meeting meant the undoing of all of these activities.

Again, the health officials of the Central States, where influenza had not yet become seriously epidemic, were eager for a discussion of the subject. They wanted to know what success the East was having with vaccines; what were their views on the subject of nose and throat sprays; what lessons was the epidemic teaching with regard to mode of treatment, the marshaling of nurses, doctors, and other forces for combating the disease.

On the other hand, as time went on it became increasingly clear that not only would the attendance from the East and South have been almost nil, but that at least a third—possibly half—of the speakers and section officers would have been absent. Boston, New York City, and Washington, D. C., whence came the great majority of the speakers, were prostrated by the epidemic.

It was after a conference with the Surgeon-General of the United States Public Health Service, who strongly urged against the meeting, that President Hastings again telegraphed the members of the Executive Committee, as a result of which action, the vote for postponement was taken.

Owing to the crippled condition of the telegraph service, the result of the vote did not reach the secretary's office until Wednesday morning, October 9. However, two thousand letters and many telegrams were rushed out to members, speakers, and others before the office force left that night. A notice concerning the cancellation was sent out over the wires of the Associated Press and the United Press from Chicago and Boston. In short, the president at Toronto, the chairman of the Central Committee at Chicago, and the secretary at Boston, did all in their power to spread news of the postponement of the meeting as widely and rapidly as possible; and it is hoped that all delegates were reached in one way or another.

The postponed meeting will be held December 9–12. Headquarters will be at Hotel Morrison, Chicago, as previously announced. In general, the arrangement of the section meetings will be relatively the same as in the original program which was published in the September issue. The more important changes will be published in the JOURNAL for November, which will appear about November 25.

Speakers are being requested to send their manuscripts to the office of the JOURNAL for possible publication where advisable, in advance of the annual meeting. Unless already forwarded, two hundred word press abstracts are also desired.

The postponement has worked a real hardship upon the section officers and the committee members at Chicago, who gave generously of their time and energy in order that the October meeting might be successful. In some instances this work will have to be repeated, especially in the case of the Chicago committees. The latter, however, have with boundless goodwill, again set themselves to their tasks; and for this, the Association owes them a great debt of gratitude.

While in one sense the postponement was a disappointment, it is believed that the December meeting will be more successful than that of October could have been, and we shall have the additional satisfaction of knowing that the best interests of the Association, of the profession, and of the Nation, will have been served by the postponement.

Decide now to come in December. In the meantime tell of the Association and the annual meeting to your public health acquaintances, plan to enrol them as members, and bring them to the meeting.

WEAPONS AGAINST INFLUENZA.

Early in October a representative of a midwestern health department went East in order to secure information as to the best-known methods of combating influenza. A number of prominent sanitarians began with this advice: "When you get back home, hunt up your wood-workers and cabinet-makers and set them to making coffins. Then take your street laborers and set them to digging graves. If you do this you will not have your dead accumulating faster than you can dispose of them." They then went on to discuss the measures which had been tried with varying success for fighting the disease itself.

The object of the foregoing suggestion was not to appear sensational or to cause undue alarm; it was a sincere effort to point out a practical condition which would probably have to be met. Very few health officers, and no communities, appreciate the terrific devastation of the epidemic until it strikes them. It has been utterly unlike any plague which has yet visited this country.

Exact statistics concerning the prevalence of influenza among the general population are not available. It seems, however, that no less than 25 per cent of the population are taken ill in communities where the disease strikes. Very roughly, the fatality seems to range within 3 and 5 per cent of the cases.

Boston, with a total population of less than 800,000, has had about 4,000 deaths from the beginning of the disease early in September to October 19. In other words, .5 of 1 per cent of the population has succumbed. If the rest of the country is afflicted in the same proportion, it is not unlikely that there will be a half-million deaths from the disease; that is, about half as many as died from all causes last year; or far more than fifty times as many as have been killed in the American army in the present war.

Among the prophylactic measures have been employed in the East: the conventional precautions against contact infection, the face mask, and anti-influenza vaccine.

Among the curative measures have been advocated: the open-air treatment, the use of serum from convalescent patients, and again, anti-influenza vaccine.

In the reduction of contact infection, the face mask, the stagger-hour system of transportation, the education of the public in personal hygiene, and the closing of schools, assemblies, etc., have probably helped somewhat. There seems to be little hope for controlling the epidemic along these lines, however, for the scourge is more communicable than measles.

As for the vaccine, the Massachusetts scientific and statistical commissions have concluded that it has no therapeutic effect,* that the prophylactic effect merits further investigation, and that no ill effects follow the use of the vaccine. The South Department of the Boston City Hospital reports 46 vaccinations, none of which were followed by influenza; on the other hand, of the remaining 88 attendants and patients, 28 contracted the disease—about a third.

Another analysis from the same figures shows that of 32 vaccinated nurses none contracted influenza; 8, who had been incompletely vaccinated, contracted mild cases. The remaining 4 nurses refused to be vaccinated: of these, two developed influenza and died.

At Wrentham (Mass.) State School, 66 vaccinations are said to have been followed by 6 mild cases. and no fatal cases. One incompletely vaccinated individual developed a fatal case. Of the remaining 58, who were not vaccinated, 33 sickened, and one died.

The results which are available are interesting and suggestive, but not conclusive; for they all have the weakness that vaccination was not begun until influenza had developed in the institution, and had taken down a number, possibly the most susceptible, who might have taken the disease even if vaccinated. But while we wait for more conclusive statistics, the epidemic rages; any community is, therefore, justified in employing the vaccine, for it is safer to gamble with the cost of preparing and administering the vaccine than with the lives endangered. It will be well to emphasize to the public that the vaccination is experimental, and is not compulsory; otherwise, in the event of its ultimate failure, the whole system of vaccination may be discredited by the public, including that against smallpox, typhoid, etc.

Turning to therapeutic efforts, the serum described in this issue by McGuire and Redden seems promising and should by all means be tried. As with vaccine, however, it is too early to make definite statements.

The open-air treatment of Brooks was found by the Massachusetts State Health Department to be the most valuable factor in reducing mortality. Apparently the fatality of hospital cases was reduced from 40 per cent to about 13 per cent by the treatment. An invaluable incident to this treatment is the fact that in the open air, the immunity of the nurses and physicians is enormously increased, leaving them to carry out the great amount of work confronting them.

What should health officers do in those communities where the disease has not yet struck? Shall they build fences to try to keep people from falling off the cliff or shall they invest in ambulances to take care of those who will have fallen?

It must be confessed that to date the preventive measures have not averted the epidemic. It would seem advisable for the health officer first to organise his open-air hospitals and relief agencies as far in advance as possible; let him organize for efficiency the doctors, nurses, social workers, teachers, and volunteers. Money and assistance will be easy to get, for the public has been aroused. With one in two hundred persons of the stricken populations dying, no community will criticise the health officer who may have prepared too thoroughly.

The health officer should also put into effect with great vigor all of the preventive measures at his disposal. Let him not neglect, however, to plan for those who are sure to become sick—and as pointed out to the investigator in the first paragraph—for those who will die.

Regrettable and discouraging as it is, we must nevertheless admit that in this specific catastrophe, the ambulance possibly will help more than the fence.

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* See the notes section of this issue, p. 802.

THE INFLUENZA PAPERS IN THIS ISSUE

Under ordinary circumstances an investigator is expected to give his discoveries most careful and deliberate scrutiny before presenting them to the scientific world. There is a great aversion, and properly so, to the hasty publication of theories.

At the present time, however, we are facing an unusual condition under which rules must give way. If we allow time for careful investigation and statistical analysis of the various means for combating the influenza epidemic, the disease will have left us before conclusions are reached. In average-size cities, the epidemic begins, reaches its crisis, and subsides to relatively small proportions in a community in scarcely more than forty-five days. In view of these facts it becomes a positive duty to immediately make known any methods of fighting the disease that seem at all helpful.

The writers of the papers in this issue of the JOURNAL have hastened to give what information they could in order to help subdue the epidemic. Their recommendations are provisional and preliminary, not final, and should be accepted as such. If some of their proposals shall not have been justified they will still be entitled to great credit for their efforts and certainly not to any blame for hasty expression.

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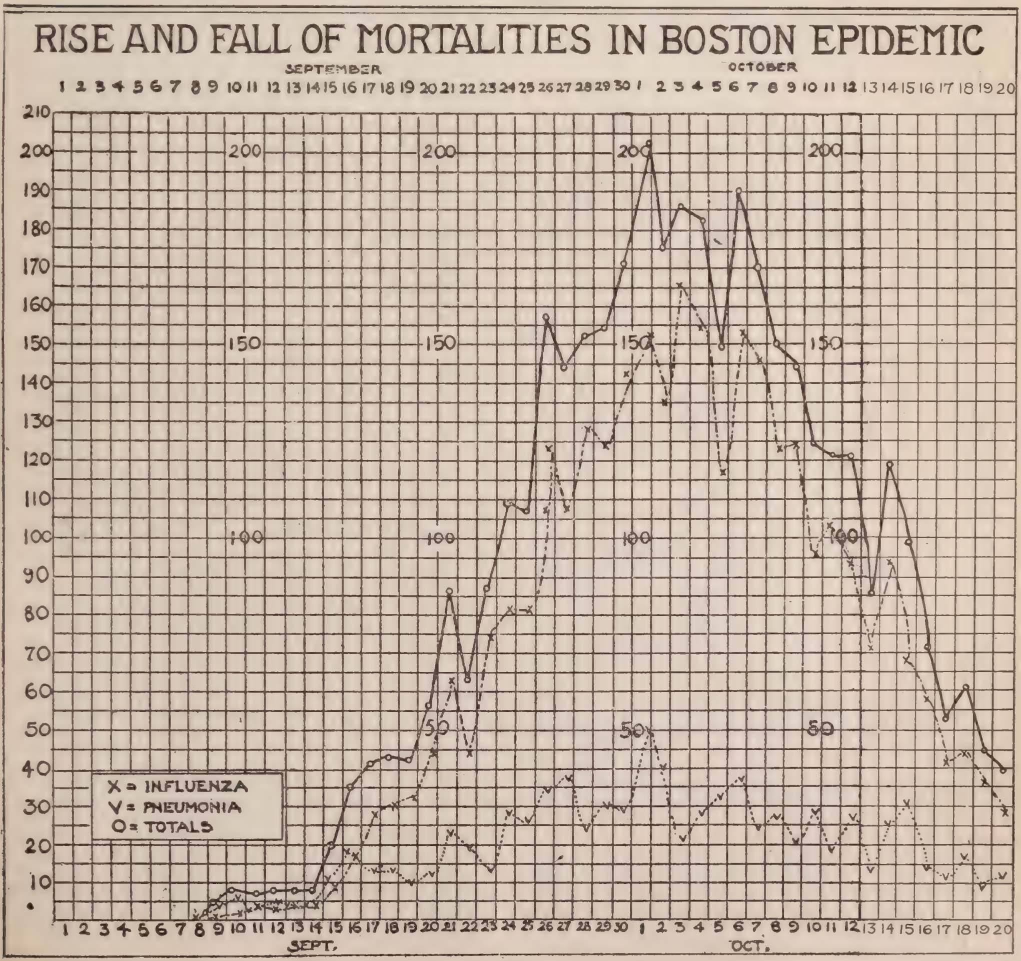

ASSOCIATION NEWS

By the Secretary, A. W. HEDRICH.

A Food Journal for the Association.—The Council of the Food and Drugs Section of the Association has recently had under consideration the advisability of publishing a journal of this type. The question arose as a result of the offer for sale to the Association of a publication which has for some years been in this field. The price set was $10,000.

Great interest was manifested in the project, and it was the opinion of the Council that a journal covering the various aspects of the food supply—regulative, nutritional, and economic—could be profitably published by the Association, and would be very beneficial to the profession. It was the recommendation of the Council, however, that the food journal in question be not taken over at this time, for various reasons; but that a committee be appointed to give the question serious consideration, with a view to taking action at a later time, possibly at the end of the War.

⁂

Health Employment Bureau.—The demand for sanitarians continues to outstrip the supply. The Health Employment Bureau receives frequent calls for applicants which it is unable to fill. Owing to the changes incident to the War, a revision of the files of applicants is about to be undertaken. Registration in the Bureau is free to members. Application cards may be obtained by writing to the office of the Association at 126 Massachusetts Ave., Boston, Mass.

Applicants are earnestly requested to answer all inquiries from prospective employers and to notify the Bureau immediately in the event that they have accepted a new position.

HELP WANTED.

In order to help relieve the shortage of sanitarians due to the war, free help-wanted announcements will be carried in this column until further notice. Copy goes to the printer on the first of each month. In answering keyed advertisements, please mail replies separately.

The Health Employment Bureau also sends lists of applicants to prospective employers without charge.

Chemist in Hygienic Laboratory, West Virginia, preferably a lady. Address No. 165, J. L. S., care of this JOURNAL.

Director of State Health Laboratory and Professor of Bacteriology and Pathology in University in Middle West. Salary, $4,000. Address No. 166, L. O. C., care of this JOURNAL.

Laboratory worker, man or woman, to do work of city laboratory, including bacteriology, food, milk, and water analysis, with ability to control filtration plant. Salary, $1,800 with prospect of prompt increase if satisfactory. Address No. 167, L. E. C., care of this JOURNAL.

Instructor in Military Hygiene and Sanitation in University in Iowa. Fundamental training in hygiene and sanitation essential. Experience in military hygiene and sanitation desirable but unnecessary. Appointment for one year. Salary between $2,000 and $2,500. Address No. 168, H. H. J., care of this JOURNAL.

Physician for assistant health officer and city and county physician in the South. Salary, beginning at $1,800 with prospects of early increase. Address No. 170, L. E. C., care of this JOURNAL.

Physician for field director, desiring to devote entire time to preventive medicine, between the ages of twenty and forty, with a pleasing personality and prepossessing appearance, good habits, energetic, reliable, and having a thorough perliminary and medical education. Salary, $2,100 a year and expenses when traveling in the interest of work. Address No. 171, C. W. P., care of this JOURNAL.

Epidemiologist in a State Health Department in the East. Address No. 172, B. T. J., care of this JOURNAL.

Health officer for Delaware city. Salary, $4,000 to $4,500. Address No. 173, C. H., care of this JOURNAL.

A trained statistician with a broad vision. Salary, between $2,400 and $3,000. Write the National Social Unit Organization, 1820 Freeman Avenue, Cincinnati, Ohio.

A Government Bureau is in need of expert sanitarians along the following lines:

Sanitarians who have had training or experience in industrial hygiene;

Physicians who have had experience in industrial diseases and accidents;

Mechanical engineers with experience in safety engineering;

Ventilating engineers acquainted with the problems involved in the elimination of fumes and gases and the removal of trade dusts.

Those who are interested should write at once, giving their qualifications, past experience, special education, age, present salary, etc. Address No. 174, N. J. B., care of this JOURNAL.

The following were elected to membership October 9:.

Marshall C. Balfour, Marlboro, Mass., Student Biology and Public Health.

E. Stewart Murphail, Ottawa, Ont., Superintendent of Compilation of Census and Vital Statistics.

Rhea R. Fuller, Cambridge, Mass., Student Massachusetts Institute of Technology.

Marion E. Anthony, Barrington, R. I.

F. M. Veatch, B. S., Lawrence, Kans., Engineer in Charge, State Board of Health.

Alvin H. Rockwell, M. D., Kalamazoo, Mich., Health Officer.

Dwight E. Breed, Austin, Tex., Executive Secretary, Texas Public Health Ass'n.

C. E. Bevan, M. D., West Haven, Conn., Physician.

Henry F. Moody, Westfield, Mass., Agent, Board of Health.

Bradford H. Peirce, M. D., Cambridge, Mass., Medical Inspector, Board of Health.

William F. Butler, M. D., New Port, Ind., Physician.

Frank M. McGauley, M. D., Fond du Lac, Wis., Physician.

J. E. Meany, M. D., Manitowoc, Wis., Physician.

Lucius H. Zeuch, M. D., Chicago, Ill., Physician and Surgeon.

Reuben L. Kahn, B. S., M. S., D. Sc., Atlanta, Ga., 1st Lieutenant, Sanitary Corps.

Gustave Windesheim, M. D., Kenosha, Wis., Health Commissioner.

Department of Health, Orange, N. J., John O'Brien, S. E., Orange, N. J.

John P. Sprague, M. D., Philadelphia, Pa., Medical Officer, U. S. Shipping Board, Emergency Fleet Corp.

Charles G. Forrest, M. D., Clearbrook, Minn., Physician.

John H. Hamilton, M. D., Iowa City, Ia., Instructor, University of Iowa.

Charles E. Riggs, Washington, D. C., Naval Officer, Medical Director.

James J. Biggerstaff, M. D., Wabash, Ind., Physician and Surgeon.

Eric A. Crull, M. D., Fort Wayne, Ind., Physician.

Virgil D. Selleck, M. D., Glen Falls, N. Y., Health Officer.

Florentino Ampil, M. D., Butun, P. I., District Health Officer, Providence of Agutun.

George H. Jones, Jefferson City, Mo., Secretary, State Health Board.

F. M. McGanley, M. D., Fond du Lac, Wis., Health Officer.

John P. Koehler, A. M., M. D., Milwaukee, Wis., Deputy Commissioner of Health.

Carroll D. Partridge, B. S., M. D., Milwaukee, Wis., City Bacteriologist.

William Frank Adams, A. B., Wilmington, N. C., Director of Public Health Laboratory.

National Life Insurance Company, Montpelier, Vt., corporate.

S. R. Klein, M. D., Ph. D., New York City.

Chalmer J. Longstreet, M. D., Binghamton, N. Y., Health Officer.

W. I. Fugate, M. D., New Castle, Ind., Physician.

Robert Hessler, M. D., Logansport, Ind., Physician.

Irwin D. Groak, Chicago, Ill., Mechanical and Consulting Engineer.

J. H. Ravenscraft, M. D., Albion, Ind., County Health Commissioner.

George O. Pobe, M. D., Port Jervis, N. Y., Physician.

Thomas P. C. Barnard, M. D., North Tonawanda, N. Y., Health Officer.

Arthur LeRoy Wheeler, M. D., Mason City, Ia., Superintendent, Department of Health.

Henry C. Schoeffle, M. D., Sandusky, Ohio.

Henry F. Miller, B. S., Kenosha, Wis., Chemist and Bacteriologist.

J. W. Fehnel, B. S., Bethlehem, Pa., Chemist and Bacteriologist.

Harry A. Neumann, M. D., Bridgeport, Conn., Industrial Physician.

James W. Armstrong, M. D., Centralia, Ill., Physician.

Reuben F. Frost, M. D., Huntington, Ind., Physician.

J. C. Quick, M. D., Muncie, Ind.

Oran A. Province, M. D., Franklin, Ind., Physician and Surgeon.

John S. Sidley, M. D., Racine, Wis.

Charles R. Cox, Hagerstown, Md., Sanitary Engineer.

Mrs. Julia Kurtz, Martha Washington Home, Wauwatosa, Wis., Manager and General Superintendent.

Otto E. Eckert, Lansing, Mich., Civil Engineer.

STORIES FROM THE DAY'S WORK

Contributions to this section are invited.—*Editor.*

AN EXPOSURE OF TWO CANCER CURE FAKERS.

How ungrounded reports of an alleged cure for cancer brought about misery and suffering came under my own observation. In a small town of some 10,000 inhabitants two gardeners, with little education and no medical knowledge, by some freak or accident were started on a cancer curing career by reason of having supposed to have relieved or cured a young man suffering from "sarcoma" of the knee joint. The veracity or reliability of this "cure" could never be determined, but such was the publicity given to the case that it was sufficient to launch a boom that nearly swamped the small town in question.

When I arrived in the locality as deputy for the local health officer, I found the town overrun with persons suffering from cancer in every variety and stage of development. Lodgings and hotel accommodations were at a premium and many of the townspeople had in pity taken the sufferers in to board.

There were at this time a number of complaints that the cancer curers had been so overwhelmed with business that they could not treat their patients in their own homes and their treatment had been carried on in backyards and in public parks and in roads. This brought about nuisances arising from soiled dressings which were thrown about vacant lots.

An investigation of the curers and the alleged cure showed that the two gardeners didn't profess to practice medicine and charged no fee for attendance or drugs provided but were willing to receive voluntary gifts for attendance upon suitable cases selected by themselves. The drugs used as the "cure" were an herbal solution for internal use and a caustic ointment made from chloride of zinc.

It was claimed by the curers that their drugs ate out the cancer which surely was true as many of the cases testified by the huge excavations and eroded surfaces seen in some of the unfortunates after treatment.

After the application of the ointment much virtue was attached to the use of a dressing made of cabbage leaves.

As more and more patients flocked to this town many complaints reached the Health Department of odors and unsanitary conditions produced by cast off dressings and cabbage leaves.

House to house investigation of the homes of the cases showed that many were without funds having spent their only available cash in railway fares to reach the town.

In response to the demand of public opinion in the town and as the falsity of the cure was already becoming known, efforts were successful to have the hopeless cases returned to their home towns by public subscription and private funds.

A publicity campaign was finally started in the district whereby the curers were discredited and the two gardeners returned to their gardening.

This little incident records the cruelty and inhumanity of widely advertised cures without the basis of truth or reason and calls again for the dissemination of knowledge of the true facts of the case for hope in the cure of malignant diseases.

C. V. Craster,
Health Officer,
Newark, N. J.

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A DIPHTHERIA SAFEGUARD.

Since 1915, the Cumberland Department of Health has required that a negative culture from the nose and throat be submitted by the attending physician, before diphtheria quarantine was raised. Though this measure resulted in some good, there was clearly too much spreading of diphtheria still. Consequently in June, 1917, physicians were advised that two negative cultures would be required from the patient before releasing, one to be taken by the physician and the second by a representative of the Health Department. When collecting a second specimen from the patient the Health Department also secures specimens from the nose and throat of each member of the family, whether sick or not.

The results secured by virtue of this order have been astonishing. It has shown us that in many cases specimens collected by physicians were either carelessly taken or else intentionally failed to even touch the area usually swabbed for diphtheria. In many cases a release culture would be submitted by a physician and upon examination found negative. The second specimen collected by the Health Department would be found positive. The physician's attention would be called to this fact and after a lapse of several days, during which time a gargle would be used, another specimen submitted by him would be negative, while a fourth specimen taken by the Health Department would be positive again. In several cases this negative and positive rotation lasted for six or eight weeks.

Collecting specimens from all members of the family has resulted in picking up a few carriers, who otherwise would have gone undetected, and perhaps caused other cases of diphtheria. The number of cases reported show that this procedure has been more than worth the trouble. When we have found carriers we have assumed that they were dangerous to be at large.

The dangers encountered by releasing diphtheria cases without securing negative specimens from the patient and his family may be well illustrated by a recent case. Six days after a three-year-old boy from Davis, W. Va., came to Cumberland to visit his relatives, a cousin, five years old, became ill with diphtheria and died. After investigating the case and collecting specimens from every member of the family and the visitors, it was found that the West Virginia boy harbored diphtheria organisms in the nose and throat. Questioning the child's mother it was learned that the boy had had diphtheria about a year ago. He had been released when the attending physician said it was proper to do so.

This case brought the matter home very forcibly, and we are now more careful than ever in releasing diphtheria cases.

Max J. Colton,
Health Officer, Cumberland, Md.

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LETTER AND REPLY.

Valparaiso, Ind., Sept. 10, 1918.

Dr. O. B. Nesbit,
Gary, Ind.

Dear Sir:

This is, you probably will think, a queer message, but my conscience has bothered me until I am constrained to write concerning it.

I rather think, although I am not certain, that you were the health officer in March and April when I had the scarlet fever. Around the end of six weeks, Papa was asked if I were through pealing and he said that I was. I don't believe I was as my heal did not exactly seem finished. However, a man, Mr. Malone, I think, was sent up and he fumigated the house and we were let out without any examination. I know, too, or was told, of another case of people getting out without being through pealing or scaling. I wonder about others being exposed by that method.

If there is a fine, let me know, just me, please, and no one else.

Yours respectfully,

——— ———.

THE REPLY.

Gary, Ind., Sept. 10, 1918.

Dear Miss:

I was not the health officer at the time you refer to. If I had been you would not have been released without an examination by a physician.

I do not think the scales from your heal at all dangerous. If you had no discharge from your nose, your throat was entirely well, there was no running ear or suppurating glands, and no cavities in your teeth, you probably did not spread the disease to any one. If any of your associates developed the disease after you were released you may have been responsible.

Sincerely yours,
O. B. Nesbit,
Director of Medical Inspection, Gary Public Schools.

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A BOLD "DOPE" SELLER.

Strange things happen to the health officer, but the strangest in my experience happened when a "hop-head" tried to make the Chief of Police and myself accessories in the sale of morphine to "fiends."

One afternoon a well-dressed man entered the Palo Alto Health Department, and asked for the health officer. He introduced himself as an operative of the United States Secret Service, and asked if I could determine the presence of morphine in some tablets he had, which he stated he had taken from a "dope fiend" in a neighboring town. I made a series of presumptive tests, and at his request made out a written statement to the effect that the tablets were 1 grain morphine tablets. He asked me a number of questions in regard to morphine users in the city, and then went to the Chief of Police, and tried to get from him a list of suspected "hop-heads," for the purpose, he stated, of apprehending them.

The next day the Chief and I discussed the matter, and our suspicions were aroused. We immediately telephoned to the Secret Service office in San Francisco, and tried to apprehend the man at the same time. The Secret Service advised us that there was no operative of that name or description, and immediately put a special operative on the case. In the meantime, the bogus operative got suspicious in some way, and we barely missed him as he got out of town. He was later apprehended in another city, being traced from the clues we supplied, and proved to be a distributor of "dope."

His game was, by this pretense, to get a list of users to whom he could sell the morphine.

Harold Gray,
District Health Officer,
Sacramento, Cal.

BOOKS AND REPORTS REVIEWED

Syphilis and Public Health. *Edward B. Vedder, A. M., M. D., Lieutenant-Colonel, Medical Corps, U. S. Army. Published by Permission of the Surgeon-General, U. S. Army. Philadelphia: Lea and Febiger,* 1918. *Cloth, p.* 315. *Price,* $2.25.

No problem of preventive medicine compares in interest and importance with the prevention of venereal diseases. This is especially true at this time when the war experience of the Allied Nations has shown the menace of these diseases to military efficiency, and reëmphasized their constant threat to the human race. Colonel Vedder's experience as an army surgeon has given him practical knowledge of army methods of control, whereby venereal disease in army life has been reduced to a minimum. His book is therefore addressed to the medical profession and to health authorities and is a plea for the application to civil life of the measures proven so successful in army life.

For the person interested in statistics, the author has compiled in brief and readable form all the statistical data available on venereal diseases; for the busy physician he has made clear the path of duty to venereal patient and society; for the health officer he has outlined plainly the only plan of preventive attack thus far that has tangible results to its credit.

The book is easily the best among the many recently published upon this subject. It is well written and timely and deserves the consideration of any one interested in the prevention of venereal diseases.

In an appendix the author describes the technic of the Wasserman reaction and includes the full text of the Australian law for venereal disease control, which is the model for most of the laws and regulations now being adopted throughout the United States. *W. F. King, M. D.*

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Farmers' Clean Milk Book. *Charles Edward North, M. D. John Wiley & Sons, Inc.,* 1918. *Pp.* 132. *Price,* $1.00.

"This book shows why some milk contains millions of bacteria and how they get into it and how easy it is to keep them out." This substantially is the text taken by the author in presenting his viewpoint of the essential subject of clean milk production. The style is lucid, simple and attractive. The farmer is shown in a practical manner the difference between successful and money-losing dairying, and the lesson is taught that cleanliness, care and oversight, as applied to milk production, have a commercial value, an argument which appeals when others might fail.

The importance of bacteria to milk is presented in such a manner as to create both interest and endeavor for increased safeguards. The human element and methods, and not elaborate and expensive equipment, are shown to be the prime factors for good milk production. The farmer is also made to realize the value of ice, cold water, steam and hot water to his industry.

The path of the dairy inspector in his dealings with the farmer might have been made smoother had the author pointed to the fact that the endeavor of these officials has been one of coöperation for better things in the production of milk. Had it not been for these efforts, doubtless this commendable and progressive work would not have been written. Dr. North's condemnation of the score card will meet the approval of many officials and farmers, even though the comparison of the score card and strainer cloth as "dangerous instruments in the dairy business" may not be fully sanctioned as to the latter by the farmer. Possibly the final chapter would carry a greater appeal if the word "good" were substituted for "Grade A," in the title, "Essentials for Grade A Milk Production."

Dr. North's work is elementary, but concise and complete, and many milk producers would benefit financially by following its teachings. It will have an important bearing in improving dairy methods, and is entitled to wide circulation.

James O. Jordan.

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The Hospital as a Social Agent in the Community *Lucy C. Catlin, R. N., Director of Social Service Work and Executive Director of the Out-Patient Department of Youngstown Hospital, Ohio.* 113 *pages, illustrated. Philadelphia and London: W. B. Saunders Company,* 1918. Cloth $1.25, *net.*

Miss Catlin's book is an indication of the rapidity with which a sense of community needs has penetrated into the medical work of hospitals. It is only twelve years ago since the first social service Department in the United States was founded at the Massachusetts General Hospital, by Dr. Richard C. Cabot. Now, about 300 of the leading hospitals and dispensaries of the country have such departments, and the number is increasing yearly. The hospital, highly specialized as it is, tends too often to look upon the patient as bringing with him simply a disease. From this old-time institutional standpoint, a patient may almost be said to be merely a disease, or a bundle of diseases. But to the social service department he is a human being. The social service department, says Miss Catlin, has two functions: (1) of completing service to the patient, by supplementing the strictly medical care with the help which will enable the patient to regain his place and take up his work, or his family life, in the community; (2) The very practical help which such a department gives to making the work of the physicians and surgeons more efficient in both diagnosis and treatment is also indicated.

Miss Catlin's book is full of stories of cases, based on her experience in Youngstown, showing many of the human problems which are met in connection with the medical work in a dispensary or hospital, and the manner in which social service assists in dealing with these problems. In comparison with the authoritative work of Miss Ida M. Cannon on "Social Service in Hospitals," Miss Catlin's book will be found to be more descriptive and less of a practical handbook of the important substance with which a Social Service department deals. Little appears in Miss Catlin's work which will help in the training of the medical social worker. There is, however, much of a descriptive nature, which will be stimulating to those who have a general interest in the subject and who are approaching it for the first time. As an introductory book for reading by nurses, teachers, doctors, and the general public, the book is one of many which are needed today. Illustrations and forms add to its interest and practical utility.

Michael M. Davis, Jr.

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A Sanitary Survey of Charleston, West Virginia

Mayo Tolman, 1918.

It is becoming more and more evident to sanitarians that the public is showing an awakening interest in public health matters. Such interest can greatly be stimulated by an exposition of the conditions and needs of a community. It is this message which is most admirably conveyed to the citizens of Charleston by the author in this survey. The report is so comprehensive that hardly more than mention of some of the topics treated can be made. The modes of transmission of the communicable diseases is clearly and interestingly narrated. Charleston's experiences with epidemics are selected for illustrations. Conditions existing in other cities are contrasted with those in Charleston and the lesson is strikingly pointed out. The question of clean milk is ably treated. A most exhaustive study of the cost of production and distribution of milk was made as part of the survey. The engineering phase of public health is most admirably treated in the sections on the water supply and the sewerage system of the city. The author wisely points out that in the solution of the housing problem "all too frequently it has been the custom to base reform in this direction on aesthetic principles and to lose sight of the fact that in the last analysis, housing must have its solution in its economic aspects." The report is written in a most readable style and is a model in the presentation of the health needs of Charleston.

D. Greenberg.

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A Practical Text-Book of Infection, Immunity and Specific Therapy. *John A. Kolmer. 2nd Edition. Philadelphia. W. B. Saunders Co.,* 1917. *Pp.* 13+978. *Price,* $7.50.

The second edition of this well known treatise will be welcomed by all laboratory workers. Among the important additions and alterations may be noted the discussion of the Schick test and the immunization with diphtheria toxin—antitoxin mixtures, the well considered expansion of the chapter on chemotherapy and the excellent sections on anaphylaxis and serum diseases. The practical experience of the author is everywhere in evidence and lends authority to the theoretical discussions. These latter, it might be added, as in the chapter on agglutinins, are sometimes not as full as some students might desire, but the need for keeping the size of the book to reasonable limits is doubtless the explanation.

The reviewer has noted but few details worthy of emendatory suggestion. On page 86 it would perhaps express more precisely the author's meaning to speak of contact with specifically contaminated objects rather than unclean objects. On page 117 it is not quite in accord with our present knowledge to call botulism "a type of meat and sausage poisoning"; by far the majority of the outbreaks of botulism poisoning reported in this country have been due to canned vegetables and fruits. The statement (page 168) regarding the infection of mosquitoes with the malarial parasites could be made more illustrative, and also more exact, if changed so as to indicate that Anopheles quadrimaculatus may serve as a host for all three parasites while A. punctipennis and A. crucians are susceptible to infection with Plasmodium vivax and Plasmodium falciparum. On page 291 B. paratyphosus B is said to be more closely related in its agglutinable properties to the typhoid bacillus than is B. paratyphosus AB. In point of fact these organisms do not show any very great differences in their agglutinative affinity towards B. typhosus; B. enteritidis is much nearer than either. A typographical omission occurs in the sentence: "In this country Bacillus paratyphosus [B?] is usually held responsible for paratyphoid fever." The statements in the same paragraph about differential serum diagnosis are partly corrected on pages 396 to 967 and 309 to 310 and might perhaps be modified so as to emphasize the great diagnostic superiority of bacterial isolation as compared with serum reactions. The parasite of syphilis is referred to as Treponema on pages 99, 292, 428 to 430, 448, and as Spirochæta on pages 416, 491, the latter name not appearing in the index. The important work of Kraus on the treatment of human anthrax with normal bovine serum will doubtless receive mention in the next edition.

Mechanically the book is excellent. There is a great wealth of illustration, including many colored plates, which will assuredly further the acquisition of exact technique. Relatively few typographical errors occur, although a letter is sometimes dropped or interpolated in certain proper names (*e. g.*, pages 262, 311, 583, 624, 650, 722, 796). The misprint Bacillis appears five times on page 693 and the common mistake of *virus fixé* is made in the section on rabies (page 685).

The book closes with an admirable series of practical exercises for the laboratory. It is not too much to say that Dr. Kolmer's work is indispensable for the practical worker in the field of infection and immunity. *Edwin O. Jordan.*

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The Principles and Practice of Infant Feeding. *Julius F. Hess, M. D. Published by F. A. Davis Co., Philadelphia,* 1918. *Price,* $2.00 *net.*

The object of this book is to present in a concise form the teachings which the author used in preparation for clinical conferences for his students. The first three chapters give a very good skeleton of what is known of the metabolism of infancy. It would have been of value, however, to have the references to look up the authority of some of the statements.

The chapters on intestinal bacteriology are especially to be commended. Practical advice in maternal nursing and wet-nursing is presented concisely and well.

The second half of the book is devoted to artificial feeding. It presents the opinions of the German School, even using the German nomenclature. It is presented in a concise and clear form.

The appendix has a valuable description of proprietary foods, and directions for the preparation of infants' foods. *Fritz B. Talbot, M. D.*

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The Wassermann Test. *Charles F. Craig, A. M. (Hon.), M. D. (Yale), Lieut.-Col., Medical Corps, U. S. A. The C. V. Mosby Company, St. Louis. Pp.* 239. *Price,* $3.00.

The medical profession will avail itself with pleasure of this publication which embodies the rich experience of the author with the Wassermann test. Part of the book is devoted to a description of the modification in use in the army. The modification was devised by the author and Dr. H. J. Nichols of the U. S. Medical Corps. It has been adopted as the standard by nearly all of the large army laboratories since 1913. It follows Wassermann in using an extract of foetal syphilitic liver as antigen and in inactivating the patient's blood serum. Like Noguchi the method employs a human hemolytic system instead of the sheep system. The authors believe that the method is well adapted to civilian laboratories. There is no doubt that this modification will be more extensively used in civilian practice upon the return of the many workers now employed in the military camps and hospitals to private life. A standardization of the Wassermann test has long been a crying need of the medical profession. Dr. Craig also discusses the original Wassermann, Noguchi, Gradwohl, Hecht-Weinberg and Kolmer technic. Considerable space is devoted to the interpretation of results and to the various factors influencing the test from the standpoint of the clinician and technician. One chapter deals with the colloidal gold test, the cell-count of cerebro-spinal fluid and with the globulin tests. The text is accompanied by numerous illustrations and well reproduced colored plates. The book should find an important place in the libraries of public health laboratories. *Arthur Lederer, M. D.*

PUBLIC HEALTH NOTES

Abstracted by David Greenberg and M. P. Horowitz.

Relative Values in Anti-Tuberculosis Work.—Attempts have been made to assign relative values to general health work. Now comes an effort to analyze the activities in anti-tuberculosis work, and to assign definite values to the various factors involved. The article, appears in the *Boston Medical and Surgical Journal* for June 20, 1918, and is written by Professor C. M. Hilliard. The various items enumerated below are thoroughly discussed:

Avoidance of infection			20
Unlimited protection up to 4 years		10	
Hospitalization of open cases		4	
Promiscuous spread of infection		3	
Anti-spitting	0.5		
Anti-sputum (education)	2.5		
Bovine tuberculosis		3	
Meat inspection	0.1		
Healthy cattle and clean milk	0.1		
Pasteurization	2.8		
Detection and cure of tuberculosis			16
Early detection		7	
Prompt reporting		3	
To authorities	1.5		
To patient and family	1.5		
Modern treatment (home or sanatorium)		4	
Open air schools			1.9
Tuberculin			0.1
Elimination of predisposing causes			39
Avoidance of fatigue		10	
Adequate nutrition		10	
Alcoholism			0.5
Occupation		5	
Dusty	3		
Other atmospheric conditions	1		
Posture	1		
Preventing other diseases		5	
Good housing conditions		1	
Ameliorating poverty		7	
Inheritance			0.5
Public Health Nursing			25
Educational work		15	
Assistance in detecting and reporting cases		3	
As a social agent		2	
Infant welfare		2	
School nursing		2	
Industrial nursing		1	

(*M. P. H.*)

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Visiting Nursing and Life Insurance.—The results of eight years of public health nursing for policyholders of the Metropolitan Life Insurance Company are summarized in an article by Frankel and Dublin in the Quarterly Publication of the American Statistical Association (June, 1918). The nursing as reflected in the condition of patients on discharge shows that in 1916 about 74 per cent were discharged as either recovered or improved, 16 per cent unimproved, 3 per cent as dead or dying, and 7 per cent unspecified.

As to the mortality experience of the Company, it is noted that this has constantly improved during the period for which figures could be obtained (1911–1915). In this period there was a decline of 9.7 per cent in the mortality from all causes whereas in the Registration Area there was only a reduction of 4.9 per cent. Pneumonia shows a reduction of 7.6 per cent among policyholders and of less than 1 per cent in the general population.

These gratifying results are attributed to the extensive distribution of the Company's educational literature, the coöperation with health officers and the very excellent activities of so many of the local and state departments of health. But the countrywide extension of the nursing service to include over two hundred thousand patients annually, the intensive work done often in the nature of emergent relief, the education in personal hygiene which follows the more than a million visits made by the nurses to industrial homes, together must be credited with a large share in this mortality reduction.

(*D. G.*)

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New Public Health Courses.—Columbia University in New York City is offering special courses in statistics which are planned to meet present needs in the community and government service, for those taking positions in business offices, social organizations, and government work. Emphasis will be placed on procedure of investigation, methods of combining, analyzing, and presenting material, and the devices for handling and presenting data in approved form. Laboratory hours will be arranged for individual practice on problems, for accuracy tests, and for demonstration of principles. Attention will be given to the construction of graphic representations and to the use of calculating devices.

The Yale School of Medicine at New Haven, Conn., offers war emergency courses in Industrial Hygiene, designed for industrial physicians and nurses, safety managers, and others interested in industrial health and welfare. Such subjects are taken up as factory accidents, industrial poisoning, factory ventilation, lighting and sanitation, etc.

Venereal Diseases and Marriage.—The Committee on Venereal Diseases and Marriage of the American Association for Study and Prevention of Infant Mortality has made its report which is worthy of careful study.

Since an enlightened public opinion is an indispensable preliminary to further progress, strong and persistent efforts should be devoted to the task of education. The committee believes that the greatest advancement will be secured through a frank, unsentimental, scientific statement of the facts to the people. The public must learn that practically every prostitute is a center of dissemination; that there is a steady procession of these diseases from the women of the street to the women and children of the home; that the diseases in question may be conveyed through kissing and by various articles used by or on infected people, particularly implements of the kitchen, the toilet and the barber shop; that very many of the serious afflictions of later life, such as paresis, locomotor ataxia, certain forms of rheumatism, blindness, heart disease, arterial sclerosis and aortic insufficiency, as well as much general impairment of health are caused exclusively or mainly by an earlier infection of syphilis. It should be well known that early stages are usually curable, that practically all stages can be benefited by treatment, and that they can be controlled as regards contagion.

The importance of early diagnosis and intensive treatment as well as the appalling results of neglect cannot be too strongly emphasized, nor can the necessity of continuing treatment until the patient is completely cured.

As a general rule no syphilitic should contemplate marriage unless the Wassermann test remains negative after at least a year of careful treatment and continues negative after a provocative Wassermann. Inasmuch as syphilis frequently and sometimes early in its course attacks the central nervous system, it is advisable for the patient, even after the blood test continues negative, to have a test of the spinal fluid made because of the danger of a cerebrospinal form.

As to the effects on progeny, improved diagnosis shows that the transmission of syphilis to offspring is far more common than was previously thought. Not only is there a waste of potential citizens to the state by miscarriage and death twice as great in syphilitic families as in similar families which are not syphilitic, but the children which survive are likely to be shot through and through with organic defects and degenerative changes.

Urgent means are needed to compel the attendance of luetic children at the clinic until properly discharged. It is a common experience that many never are returned after the initial visit or are brought for a short period only, possibly until the acute symptoms are cleared up.—*Trans. VIII, Annual Meeting of Amer. Ass'n for Study and Prevention of Infant Mortality*, 1917, p. 92.

(*D. G.*)

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Prevention of Pneumonia.—Rufus Cole says that up to last autumn little attention was given to pneumonia as a probable menace to our newly formed army. A year ago the discussion of the subject would have been confined to a consideration of the prevention of acute lobar pneumonia due to pneumococci, but today we have entirely changed our point of view, and the acute lobar pneumonia is considered an endemic disease, while streptococcus pneumonia, which has become so prominent of late, occurs chiefly in epidemic form on account of the extreme variableness in the pathogenic properties of the streptococcus. Dr. Theobald Smith has called attention to the fact that streptococcus infections in animals are not self-perpetuating. They occur as epidemics, usually secondary to other diseases. This is also true in man. A suitable soil is needed and, this provided, the germs rapidly gain in virulence. An epidemic of measles provides the proper soil. Such an epidemic probably is unpreventable but the number of cases can be possibly limited. The time to stop streptococcus bronchopneumonia is at the beginning. Later it is extremely difficult. The measures to be taken are reviewed and especial emphasis laid on isolation. The personnel of the infectious disease hospital should be distinct from the general one, and have the facilities for still further divisions as measures of prevention of the spread of disease. The prospects of treatment of the lobar type of serum methods are sufficiently promising to warrant their thorough trial.—Cole, R., *Journal A. M. A.*, Aug. 24, 1918, p. 635.

(*D. G.*)

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A Correction.—In the July issue of the Journal on page XI we credited Dr. Lydia Allen DeVilbiss with a short poem entitled "Mary's Little Cold." We are informed that Dr. DeVilbiss is not the composer and that the latter is unknown.

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Effects of High Explosives Upon the Ear.—In his summary the author notes that from concussion due to high explosives there is frequently an injury demonstrable in the ear. Where the conducting mechanism is damaged or destroyed, improvement requires longer time and complete recovery cannot be expected. There may persist for a long time an inability to grasp intelligently what is said or to retain the memory of it. The outlook is good, as a rule, especially if there is no history of marked dizziness or paralysis of face muscles nor disturbances in the patient's temperature.—J. Gordon Wilson, *Jour. A. M. A.*, August 24, 1918, Vol. 71, No. 8, pp. 628–635.

* * *

The Importance of Milk and Vegetables in the Diet.—As a result of recent researches, profound changes have taken place in our idea of what constitutes a satisfactory and efficient diet. Milk is one food for which there is no satisfactory substitute. The use of milk, vegetables, green leaves such as lettuce, fruits and nuts in large amounts in the regular diet is recognized today as essential. Milk is important for various reasons. For instance the amino acid make-up of milk proteins gives them unusually high nutritive efficiency. The fat of milk has a low melting point and exists in an emulsified form. These properties are favorable to the ease and completeness of digestion. There is also a fat soluble substance which promotes growth and materially aids in promoting good health. The milk sugar is not only readily digested, but it has a favorable influence on the bacterial conditions in the intestinal tract. Milk also contains all the inorganic elements required in human nutrition. Besides possessing a fat soluble substance, milk also has another dietary essential, known as water soluble B. Milk may be used to replace meat in the diet, but the reverse cannot be practiced, if a satisfactory diet is to be maintained. A supply of at least a pint of milk per capita per day is desirable for every family.

A study of the diets of numerous families showed that there were usually deficiencies due to the inadequate use of milk, edible green vegetables, fruits, etc. The calcium content of these diets was usually low. These deficiences can always be corrected by increasing the use of milk and vegetables in the diet. The consumption of less meat and more milk is not only patriotic at present, but it aids in giving the American people a satisfactory diet.—Dr. H. C. Sherman, *American Medicine*, June, 1918. (*M. P. H.*)

* * *

Restaurant Facilities for Shipyard Workers.—After England was in the war for a short time, it was soon realized that adequate lunch room facilities would have to be furnished to the workers at the large industrial plants if the army was to be adequately supplied with munitions and other necessaries. As a result, numerous industrial canteens were established. The benefits from these were as follows: (1) Marked improvement in the health of the worker; (2) less sickness; (3) less absence and broken time; (4) less tendency to alcoholism; (5) increased efficiency and output; (6) saving the time of the worker; (7) providing a salutary change from the workshop; (8) greater contentment of the worker; (9) better midday ventilation of the workshop; (10) increase of recreation and games in the spare time.

When the ship building program of the United States got under way, one of the serious handicaps under which the men labored was the inadequacy and poor quality of lunch room facilities. The report, written by Frederick S. Crum and published by the Industrial Service Section of the *Emergency Fleet Corporation*, represents a thorough study of the lunch room question. Numerous photographs and plans of existing lunch rooms are given. Typical menus employed with satisfaction in different plants are recorded. The construction, equipment and management of lunch rooms are also carefully considered. A special chapter is devoted to sanitation and hygiene and deals with the following topics: Location, lighting and ventilation of canteens; Necessity for adequate refrigerators; Importance of sanitary store rooms; Quality of food; Pasteurization of milk; Necessity of a pure water supply; Dish washing and general cleanliness; The health and hygiene of restaurant employees; Lavatories and wash rooms; Care and disposal of kitchen garbage and rubbish; Protection against the fly nuisance; Restaurant inspection. (*M. P. H.*)

* * *

Education Through the "Movies."—Various cities have found the motion picture of great importance in enlightening the public regarding civic matters. The Municipal Reference Library of New York City has recently made a study of this subject, in the course of which manufacturers of educational films were interviewed, and as a result a subject list of civic motion pictures has been prepared. This list is contained in a bulletin entitled "Teaching Citizenship via the Movies," by Ina Clement. (*D. G.*)

* * *

Rural Health Centers.—In rural or semi-rural districts it would be advisable to carry on the work for the permanent appointment of a visiting trained nurse, by interesting the officials and membership of the local Granges and Farm Bureaus. It will frequently happen that several towns can be consolidated through the efforts of the respective supervisors, the local Granges, Farm Bureaus and health officers in support of one trained visiting nurse. A center could be established under each local health officer—without unnecessary expense and without too elaborate equipment in each of the townships, and a visiting trained nurse located centrally could attend the several centers in rotation on appointed days, her other spare time being devoted to visitations in the homes. In this way the distance to each local center from the surrounding homes would be greatly diminished, and a great conservation of time and increased attendance result. (*D. G.*)

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Malaria and the Railroads.—In order to maintain a high degree of efficiency on all railroads it is of prime importance to give every possible attention to the protection of the health of railway employees. So far as malaria is concerned, there are certain steps to be taken, in addition to drainage measures. These are, the screening of outfit cars, screening of stations, the furnishing of wire at cost for the screening of employees' homes, the use of immunizing doses of quinine at all points where there are large numbers of employees who cannot be protected through the elimination of malaria infection by destruction of mosquito carriers, and the dissemination of literature on malaria.—Van Hovenberg, H. W., *Southern Medical Journal*, 1918, 8, p. 562. (*D. G.*)

L'hygiène! je m'en fiche...
Moi, je balaye à sec

Sanitary Conditions in Fort Worth, Texas.—Under the direction of Dr. J. G. Townsend, health conditions in Fort Worth are being greatly improved. After examining the public water supply and finding that safe, attention was directed against the open privy; 1600 homes have been equipped with modern sewerage facilities, and about 2,600 sanitary toilets have been installed during the past three months. Sanitary toilets are also being installed in the homes around Camp Bowie. Swamps were drained, and other precautions were taken to prevent the breeding of mosquitoes. Rubbish and garbage collection and disposal were systematized. Lunch rooms and soda water fountains were required to comply with the best sanitary practices. Food handlers were required to show medical certificates, and the common roller towel and public drinking cup had to be abandoned. The dairies were inspected, and all milk had to come up to the government standards before it could be sold. Barber shops were required to sterilize all instruments and to use individual towels. Barbers were forbidden to treat sores or pimples. Over 20,000 inoculations were made against typhoid. A venereal disease clinic was also started. As a result of this work, there has been less sickness in Fort Worth, than ever before. (*M. P. H.*)

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Purification of Wastes Produced from Canning Pork and Beans.—This investigation was undertaken by the United States Public Health Service at the request of the National Canners' Association with the sewage of one of the canneries. A large volume of highly concentrated waste was produced that was causing a nuisance in the town in which the factory was located. The odors from the ditch within the town were very materially reduced by screening the wastes. A small testing station was established for experimental purposes and the results obtained proved that the wastes could be purified by passing them through a settling tank and applying the effluent from the tank on a sand filter. The settling period was approximately four hours and the rate on the filter 80,000 gallons per acre per day.—H. B. Hommon, *The Canning Trade*, 41, *No.* 51 and 52 (1918). (*Arthur Lederer.*)

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Mortality from Tuberculosis Among Wage Earners, 1911–1916.—In the *Journal of Outdoor Life* for September, 1918, Dr. Louis I. Dublin of the Metropolitan Life Insurance Company, analyzes the mortality records from tuberculosis among the insured wage earners from 1911–1916. These records are analyzed according to color, age, and sex.

During the six year period, there were 110,363 deaths from tuberculosis in the Industrial Department of the Company. This represents 17.4 per cent of the deaths due to all causes in this Department. Of the 110,363 deaths from tuberculosis, 93,526 deaths or 14.7 per cent were due to pulmonary tuberculosis.

Comparing the percentage of colored to white mortality from pulmonary tuberculosis for each sex, at specified age periods, it was found that in the age groups from 1 to 14, the colored mortality both for males and females was from eight to eleven times as great as for the whites. Although the differences become smaller in the other age groups, the colored mortality is always greater than the mortality among the whites.

Another interesting fact brought out by the study is that up to the age of 19, the percentage of white female deaths from pulmonary tuberculosis is considerably greater than for the males. The same holds true for the colored females, the age limit being 24 instead of 19. Above these respective age limits the percentage of deaths from pulmonary tuberculosis is much greater for both white and colored males. The figures for the United States Registration Area are also analyzed in the same way. Similar results are obtained; certain differences that exist in the specific age groups for both sets of figures are made apparent. The trend of mortality from tuberculosis of the lungs seems to be downward. This is particularly marked among the whites. The greatest progress seems to have been made in the age groups from 5 to 44. The greatest relative decline in the tuberculosis death rate has occurred at those ages in adult life when the rate is highest and when life is most valuable to the community. The paper opens up several lines along which further research would seem to be well worth while. (*M. P. H.*)

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Public Health Nursing Service in Extra Cantonment Zones.—As is well known, the United States Public Health Service has taken over the sanitary work in the extra cantonment zones, not only to safeguard the soldiers, but also to protect the civil population. In many cases, the work had to be organized from the earliest beginnings. A survey of the local situation was usually first made, and a definite plan adopted. Various organizations, clubs, societies, individuals and officials of local prominence were interested and funds were obtained to carry out the proposed plan of health protection.

Much attention was devoted to safeguarding the water and milk supplies, and in supervising lunch rooms and restaurants. Anti-malarial work was also carried on, in many places on a large scale. But besides these activities, public health nursing was introduced. The work of the nurse was mostly educational. There was very little time to do bedside nursing. The diseases which occupied the attention of the nurses most, were measles, pneumonia, mumps, smallpox, and meningitis. School nursing was also started in many places. In combating disease, the various officials had the services of excellent laboratories at their disposal. Venereal disease clinics were also established and much good was done along this line too. It is also planned to begin child welfare work, including prenatal and maternity care. Wherever possible the existing forces or agencies in the community are asked to coöperate.—Mary E. Lent, *The Public Health Nurse Quarterly*, July, 1918. (*M. P. H.*)

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STATE PUBLIC HEALTH NEWS.

Our readers are invited to send personal and general announcements and news items for insertion in these columns. Members entering the military service are especially included. Please send such items upon a separate sheet.

Arizona.—Dr. Orville Harry Brown has been appointed State Superintendent of Health of Arizona. Dr. Frederic T. Fahlen, Acting Assistant Surgeon, U. S. P. H. S., has been appointed Deputy Superintendent, and is in charge of the venereal disease program in the state.

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Indiana.—The Division of the Indiana State Board of Health created a Division of Venereal Diseases in June, 1917. In February, Dr. W. F. King was made Superintendent of this Division. Later Dr. King was admitted to the United States Public Health Service as Acting Assistant Surgeon. There was also added to our force Dr. Edward Helwig, Acting Assistant Surgeon, U. S. P. H. S. Dr. William Shimer, Superintendent of Pathological and Bacteriological laboratories of the State Board of Health has been appointed Acting Assistant Surgeon, U. S. P. H. S., and is now taking a special course at the Rockefeller Institute, New York. Upon his return a class for health officers in what might be termed the New Public Health will be established, the chief teaching of which will be extra cantonment sanitation and hygiene. The food and drug laboratories and the water and sewage laboratories of the Indiana State Board of Health are being remodeled and refurnished. Inspectors will be provided with automobiles and will not depend upon cars and trolleys for transportation.

(*J. N. Hurty, M. D.*)

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Illinois.—The State Department of Public Health has announced the establishment of twelve military zone health districts, each ten miles in diameter surrounding military camps and cantonments and schools and colleges in which military instruction is being given. The Department of Health will conduct special activities in these zones, particularly in regard to venereal diseases and has called upon local health authorities to observe all Federal, state, and local health laws, rules, and ordinances.

As an emergency measure to become immediately effective, the State Department of Public Health, has recently issued Rules and Regulations for the Control of Influenza making this disease reportable and subjecting infected persons to quarantine.

In the wartime tuberculosis work which is being conducted in Illinois jointly by the State Department of Public Health, the Illinois Tuberculosis Association, and the State Council of Defense, a special effort is being made to create interest on the part of the medical profession in the early diagnosis of the disease. To this end, two large clinical conferences have recently been held in Springfield, and county and district clinical conferences are now being conducted in different parts of the state.

At the annual meeting of the Illinois Tuberculosis Association, held in Springfield on September 17th, Dr. George Thomas Palmer, was elected President for the ninth successive year. The chief activities of the Association during the past year are the care of returned tuberculous soldiers who now number in excess of 1,500 in Illinois, and the direction of campaigns for the establishment of tuberculosis sanatoria, dispensaries and nursing service in thirty-four counties of the state.

The following members of the staff of the Illinois State Department of Public Health are now in military service: Capt. Paul Hansen; Capt. John A. Kappelman; Lieut. M. Warren Cowles; Lieut. George Sorgatz, M. D.; Lieut. James R. Pollock, Sanitary Corps; Mrs. Gertrude Kuhlmann; Frank Smejkal; Sergt. Earl B. Searcy; Alfred Harkness; Chester F. Clark; William J. Angsten; Harold B. Fromme; Fay Ikes.

Dr. A. E. Campbell, for the past seven years sanitarian for the Illinois Central Railway, has accepted the position of full time Health Officer for the city of Springfield.

Dr. G. G. Taylor, Chief of the Division of Social Hygiene of the State Department of Public Health, has recently made a tour of inspection of eastern and western cities in military camps preparatory to the extension of venereal disease work in the zones surrounding military camps.

(*George T. Palmer, M. D.*)

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Iowa.—Mr. Jack J. Hinman, Jr., Bacteriologist and Chemist for the State Board of Health of Iowa, has been commissioned a first lieutenant in the Sanitary Corps.

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Massachusetts.—Influenza apparently first reached Boston about August 25, and by the middle of September had reached epidemic proportions. On October 4, the disease was made reportable over the state, and from 6,000 to 8,000 cases were reported daily. The fatality is very high—about 5 per cent. By October 12, influenza was on the decline in Boston, only about 120 deaths being reported daily from influenza and pneumonia, as opposed to 200 when the epidemic was at its height. However, the western part of the state, which was attacked later, was becoming more seriously involved about the middle of October.

Dr. E. R. Kelley appointed two committees to study the value of an influenza vaccine prepared by Dr. Timothy Leary of Tufts Medical School. The Board of Scientific Investigation, consisting of Drs. M. J. Rosenau, D. W. McCoy and Frederick F. Gay, concluded as follows:

1. The evidence at hand affords no trustworthy basis for regarding prophylactic vaccination against influenza as of value in preventing the spread of the disease, or of reducing its severity. The evidence from the present epidemic, though meagre, suggests that the incidence of the disease among the vaccinated is smaller than among the non-vaccinated. The Board, therefore, concludes that further experimental evidence should be collected.
2. The evidence at hand convinces the Board that the vaccines we have considered have no specific value in the treatment of influenza.
3. There is evidence that no unfavorable results have followed the use of the vaccines.

The Board of Statistical Investigation reached substantially the same conclusions. It consisted of the following: Prof. G. C. Whipple, Dr. W. H. Davis, Dr. Frederick C. Crum. It was further pointed out that open air treatment and the use of face masks were effective in protecting exposed persons.

It is recommended that the distribution of influenza vaccine be encouraged for prophylactic use in order to obtain further experimental evidence, but that the State neither furnish nor endorse the vaccine at present for therapeutic use.

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Minnesota.—A localized epidemic of poliomyelitis is at present in progress at Spring Grove, Minn. Thirty-three cases have been reported thus far.

Dr. J. Arthur Ohage, for some years Health Commissioner of the city of St. Paul, was recently succeeded by Dr. B. F. Simon.

The city work house at St. Paul has recently put into operation a ward for the treatment of inmates infected with venereal disease. This is being undertaken at the present time as a part of the program for venereal disease control which is being conducted by the State Board of Health and with the coöperation of health and law enforcement authorities of the Twin Cities.

Mr. H. A. Whittaker, Director, Sanitation Division, State Board of Health, left for France for work with the American Red Cross in September.

Dr. P. M. Hall of Minneapolis, Director of the American Public Health Association for this district, became Superintendent of the State Tuberculosis Sanitorium at Walker, August 1.

Representatives of the State Board of Health and of the State Advisory Commission on Tuberculosis Sanatoria are conducting a joint survey of tuberculosis cases in Roseau County. This is a thinly and newly settled county of large area, located on the Canadian border. The survey was undertaken in this particular area because of the known existence of unusual prevalence of tuberculosis, as compared with the general incidence of the disease in Minnesota.

During the first month of venereal disease reporting in Minnesota, the results were as follows: syphilis, 304 cases; gonorrhea, 189 cases; chancroid, 7 cases. Over two-thirds of the cases of syphilis and half of the gonorrhea were reported from Minneapolis. One hundred and twenty-seven physicians and institutions and 47 communities reported.

(*L. W. Feezer.*)

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New Hampshire.—Dr. Charles Duncan has been appointed Secretary of the State Board of Health to succeed the late Dr. Irving Watson. Previously, he was director of the State Board of Health Laboratory.

Dr. Charles A. Weuner is officer in charge of venereal disease control.

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New Jersey.—A Bureau for the Control of Venereal Diseases has recently been established by the Department of Health of the state of New Jersey and the work will be carried on in coöperation with the United States Public Health Service. Capt. J. Holmes Smith, M. D., passed Assistant Surgeon of the United States Public Health Service, has been placed in charge of the Bureau and he is assisted by Lieut. James W. Richards, M. D., passed Assistant Surgeon of said Department. Dr. Smith is busily engaged in coöperating with the local authorities in the various municipalities of the state and has already secured the establishment of a number of clinics. An extensive campaign of education will be carried on with the assistance of various civic associations and large industrial plants.

Dr. Julius Levy, of Newark, has just been appointed Consultant to the Division of Child Hygiene of the Department and the work of this Division will be reorganized and largely expanded. A number of nurses will be employed and Dr. Levy is at present engaged in outlining a plan for the successful carrying on of this very important work. The Women's Committee of the Council of National Defense, the Executive Committee of the Federation of Women's Clubs and the Executive Committee of the Parent Teachers' Association will coöperate in this work in every way possible.

(*J. C. Price, M. D.*)

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New York City.—On September 17, 1918, an amendment to the Sanitary Code, Section 86, was made to include in the reportable diseases, acute lobar pneumonia, bronchial or lobular pneumonia and influenza and requiring that such cases be segregated. Cases in hospitals were to be placed in wards and regarded with special consideration but not to be quarantined in isolation pavilions.

A circular letter has been sent to all the physicians in the City of New York calling their particular attention to these diseases and the action requested regarding them.

The following is a résumé of the statistics. Influenza not being a reportable disease there were no cases reported prior to September 19, 1918, on which date the letter containing this information was sent to physicians.

September 19, 47 cases of influenza.

September 20, 30 cases of influenza.

September 21, 20 cases of influenza.

September 23, 85 cases of influenza (including Sunday).

September 24, 42 cases of influenza.

The above is exclusive of cases in military cantonments. The Bureau of Vital Statistics of this Department reports deaths for the week ending September 14, and September 21, as follows:

	Lobar pneumonia	*Broncho pneumonia*	*Influenza*
September 14.......	44	30	2
September 21.......	67	31	8

Under separate cover, I am sending you a photographic copy of one of two public notices which were distributed broadcast by means of placards. They were posted up in railroad stations, ferry houses, public schools, public buildings, etc., etc.

In order to centralize the field activities and provide for the citizens easier access to the various offices of the Department, the Commissioner of Health on October 1, 1918, will abandon all bureau control in the field and return to the form of control called for by the Charter requiring an assistant sanitary superintendent in charge in each borough. Commencing October 1, 1918, under the control of Sanitary Superintendent, Dr. Frank J. Monaghan, the control of the several offices in the different boroughs will be as follows:

Manhattan: Dr. Alonzo Blauvelt, Assistant Sanitary Superintendent.

Brooklyn: Dr. Herman T. Peck, Assistant Sanitary Superintendent.

Bronx: Dr. Arthur T. O'Leary, Assistant Registrar and Acting Assistant Sanitary Superintendent.

Queens: Dr. John F. Barry, Assistant Sanitary Superintendent.

Richmond: Dr. Edward T. Wisely, Medical Inspector and Acting Assistant Sanitary Superintendent. (*S. Dana Hubbard, M. D.*)

Mr. Arthur S. Bedell, of Albany, N. Y., leaves this country as sanitarian on the Red Cross Mission to Greece.

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North Carolina.—Through the efforts of the Bureau of Medical Inspection of Schools of the State Board of Health two counties of the state have arranged for the installation of permanent dental clinics for the benefit of the school children.

The clinics are to be operated through the coöperation of the counties and the State Board of Health, the expenses to be shared jointly. A splendid dental equipment, with all necessary supplies, is provided and attractive offices will be fitted up in rooms assigned in the court houses.

These permanent county dental clinics, like the traveling clinics now in operation in a number of counties in the state, are a part of the follow-up work of the medical inspection of schools.

It is the plan of the State Board of Health to have a circuit of four counties for the permanent clinics with one dentist in charge having a fixed itinerary. By this means the expense for a year after the equipment is installed to a county will be only $600, and half of this is to be paid by the state. The dentist would divide his time equally between the four, giving each a month in rotation.

Inspectors of the State Board of Health have completed the inspection of forty-eight of the one hundred county jails of North Carolina as provided by an act of the legislature of 1917. A tabulation of the reports shows that very few jails of the state are maintained according to the sanitary rules and regulations adopted by the State Board of Health for the protection of the physical well-being of the inmates. (*D. G.*)

⁂

Ohio.—The State Department of Health has announced its readiness to assist any manufacturing establishment in the state to decrease the ravages of venereal disease among its employees. There will be furnished educational posters for use in the plant, circulars of information on venereal disease for distribution among the men, enclosures for use in pay envelopes, and representatives of the Department to give illustrated talks. It is realized that industrial plants whose continued operation at highest efficiency is so important a matter in time of war, offer one of the most fruitful fields for work in venereal disease prevention. (*D. G.*)

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Pennsylvania.—The Department of Health of the Commonwealth of Pennsylvania has extended its Genito-Urinary Dispensary system to a chain of thirty-two dispensaries operated in the various industrial and populous centers of the Commonwealth and is coöperating closely with the Courts and with the United States District Attorneys in handling criminals and quasi-criminals and keeping them under supervision until certified by Department officers as free from infection. The following physicians have so far been appointed as Chiefs of these dispensaries in the places enumerated:

Dr. George J. Muellerschoen, Philadelphia.
Dr. Charles P. Henry, Reading.
Dr. John M. Oenslager, Harrisburg.
Dr. Edward Lyon, Williamsport.
Dr. P. P. Mayock, Wilkes-Barre.
Dr. Charles Rea, York.
Dr. C. H. Witmer, Lancaster.
Dr. H. O. Jones, Altoona.
Dr. Robert L. Schaeffer, Allentown.
Dr. John B. Cressinger, Sunbury.
Dr. Frank C. Garvey, Scranton.
Dr. W. D. Chase, South Bethlehem.
Dr. James C. Burt, Pittsburgh.
Dr. Benjamin A. Bealor, Shamokin.
Dr. Herman D. Boyles, New Castle.
Dr. P. P. Fisher, Sharon.
Dr. H. P. St. Clair, Butler.
Dr. Seth A. Light, Lebanon.
Dr. William O. Lubken, Johnstown.
Dr. M. C. Householder, Pottsville.
Dr. J. J. Condran, Easton.
Dr. John Steel Anderson, Greensburg.
Dr. Edward H. Drozeski, Erie.
Dr. J. P. Strayer, Oil City.
Dr. M. A. Neufeld, Chester.

Dr. Charles M. Rickert has been appointed Assistant Chief Medical Inspector in the Department of Health.

Dr. J. L. Seibert of Bellefonte, Center County, has been appointed to act as County Medical Inspector of that County during the absence of Dr. S. M. Huff who has gone into Service.

Dr. A. H. Smink of Shamokin, Northumberland County, has been appointed to act as County Medical Inspector of that County during the absence of Dr. R. H. Simmons who has gone into Service. Dr. Clarence Malone was formerly Acting C. M. I. of this County; he has also gone into Service.

Dr. Robert Barckley of Milford, Pike County, has been appointed to act as County Medical Inspector of that County during the absence of Dr. W. B. Kenworthy who has gone into Service.

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Washington, D. C.—Dr. Harry S. Bernton, pathologist to the State Board of Health of Rhode Island, has resigned to become the chief of the Bureau of Preventable Diseases and director of the biologic laboratories of the Health Department of the District of Columbia.

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Wisconsin.—A smallpox and scarlet fever scare at Glidden, Ashland County, recently led to the general vaccination of school children and other preventive measures by the Board of Health.

Pollution of the city water supply of Washburn, derived from Lake Superior, has been found by state analysis. The State Board of Health has ordered chlorination.

The report of chemists on the condition of the Milwaukee city water supply found its bad taste was due not to chlorine but to the action of the chlorine on coal tar products in the water. Further findings attributed the presence of coal tar products to waste from industrial plants. Elimination of this waste from the water supply has since been sought in conference with the manufacturers, who agreed to provide septic tank treatment or other approved means for avoiding further pollution.

The State Coöperative Laboratory of Hygiene at Superior has been directorless for some time owing to the enlistment of William Strasser, and efforts to fill the place have been vain because of the demand for chemists and bacteriologists in war work. The same situation obtains at Wausau.

No contagious disease had been reported in Eau Claire for more than a month, according to a report on September 1.

The quarantine of southern Wisconsin counties for rabies, instituted last spring, has greatly lessened cases of rabies in that section, but has been extended for an indefinite period.

Eleven college women have been accepted for the limited class organized for the new training course in public health work established by the Wisconsin Anti-Tuberculosis Association at Milwaukee. This course, designed to equip well educated young women for health work in schools, city health departments, laboratories, etc., for the fight against preventable disease, is said to be the first of its kind in the United States. The scholarships for the course have been granted to Mrs. Cora Froehlich, the Misses Erna Suttinger, Cora A. Brockhausen and Margaret Hennessey, Milwaukee; R. Claire White, Madison; M. Josephine Conlin, Columbus; Lela Bennett, Lancaster; Helen Corsaw, Union Center; Alvina A. Klein, Weyauwega; Mercy A. Rockwood, Oshkosh, and Ruth R. Forbes, Pontiac, Ill.

Reorganization of the Racine Health Department on modern lines was recommended officially by the new assistant health commissioner, Dr. H. L. Wilson, who proposed that all health activities be placed under this department; that the health commissioner be made the official head of the department; that he be a physician, appointed by and responsible to the Board of Health; that the department consist of a health commissioner, a clerk, a woman dairy and food inspector, a quarantine officer, two sanitary inspectors, and six nurses; that school health inspection, clinics for indigent children, an infant welfare station, tuberculosis dispensary, and modern isolation hospital be established.

(*L. W. Bridgman.*)

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Health Mission to Italy Under Red Cross Auspices.—The mission will sail for Italy to conduct a health campaign in that country with the stamping out of tuberculosis as its particular objective. The unit will be under the supervision of Col. Robert Perkins, Red Cross commissioner for Italy. Included in the personnel of the unit, which numbers sixty persons, are many of this country's best-known tubercular specialists, as well as physicians who have been very successful in the lines of work which they will be called upon to perform. The director of the unit is Dr. William Charles White, of Pittsburgh. Others are:

Dr. John H. Lowman, professor of clinical medicine at Western Reserve University, Cleveland, chief of the medical division; Dr. Louis I. Dublin, of New York, statistician of the Metropolitan Life Insurance Co., chief of the division of medical statistics; Dr. Richard A. Bolt, of Cleveland, connected with the health department of that city, chief of child-welfare division; Dr. E. A. Paterson, of Cleveland, chief of division of medical inspection of public schools; Dr. Robert G. Paterson, of Columbus, Ohio, head of the tuberculosis branch of the State Health Department, chief of the division of education and organization; Miss Mary S. Gardner, head of the bureau of public-health nursing of the American Red Cross, chief of division of public health nursing.

The executive manager of the organization is Lewis D. Bement, of Framingham, Mass.

Dr. C. F. Bolduan, formerly director of the Bureau of Health Education at New York City is now in a similar capacity with the United States Public Health Service. (*Arthur Lederer, M. D.*)

INDUSTRIAL HYGIENE AND OCCUPATIONAL DISEASE

Abstracted by Drs. E. R. Hayhurst, R. P. Albaugh and P. M. Holmes.

Uniform Occupational Disease Act.—A draft of an act relating to compensation for industrial disease, intended as a supplement to their draft for a uniform workman's compensation act, was included in a report of a Special Committee on Occupational Diseases (in the Ninth Annual Report) of the Board of Commissioners for the Promotion of Uniformity of Legislation in the United States. The draft submitted follows closely the provisions of Section VIII of the British Workmen's Compensation Law of 1906 and provides only for the compensation of "those relatively few diseases to which the public at large, generally speaking, is not subject, which are attendant upon and peculiar to specific industrial processes and for which the industry itself is wholly or principally responsible." The draft, as arranged, excludes tuberculosis and other non-specific occupational diseases, saying that there is already a movement started looking toward the care of this "larger class of occupational diseases" by what is called health insurance.—*Monthly Review, U. S. B. of L. S.*, June, 1918, pp. 219–221.

⁂

Examination of Men Entering the Aviation Corps.—The author has devised a hermetically sealed cabinet with an exhaust pump and gauge by which conditions of sudden change in air pressure, such as occur to the aviator, can be duplicated in the cabinet. The man is first given the usual physical tests as to pulse, blood pressure, muscular tone and effects of rotation. He is then placed in the cabinet and the air exhausted at the rate of "1,000 feet altitude per minute until he has reached a height of 6,000 feet." He is kept in this rarifaction (which represents altitude) for a given length of time. In trying men who had flown, it was determined that the sensations they experienced in the cabinet were exactly similar to those they had had in actual flight, such as the pain experienced in the ears and head. More work along this line is advocated as one of the best methods of testing out applicants for the aviation service.—C. M. Robertson, *Jour. A. M. A.*, September 7, 1918, Vol. 71, No. 10, pp. 813–817.

⁂

Mortality From Respiratory Diseases in Dusty Trades (Inorganic Dusts).—This 458-page bulletin sums up the principal literature as well as the actuarial experiences and statistical publications having to do with the features in the title. So far as can be seen, all phases of the question as regards, cause, extent, effect and correction are portrayed with careful detail with a free acknowledgement of sources of information. Naturally, the discussion has most to do with pulmonary tuberculosis in its industrial relations. The various occupations exposing to metallic dust take up pages 51 to 161. The general conclusion is that the death-rate from all causes and the specific death-rate from pulmonary tuberculosis among men is decidedly excessive at all ages and extremely high during the age period 25–54. Exposures to mineral dust occupy pages 163–322, where, among general conclusions, it is stated that the proportionate mortality from pulmonary tuberculosis and other respiratory diseases is excessive at all ages, while that for non-tuberculous respiratory diseases is decidedly excessive for the older ages. The mineral industries (mines, quarries, ore reduction and smelting) are considered separately and conclude the bulletin with the exception of some final pages on general observations and conclusions. With respect to coal mining an appeal is made for future investigations, both medical and statistical, with due regard to more exacting requirements, so that the existing amount of more or less misleading information may be replaced by trustworthy data and conclusions which bear the stamp of scientific accuracy.—Frederick L. Hoffman, *Bull., Whole No.* 231 (*Industrial Accident and Hygiene, Series No.* 17), June, 1918, *U. S. B. of L. S.*, Washington, D. C.

⁂

Want Medical Examinations for Industrial Workers.—Samuel Gompers, as chairman of the Committee on Labor of the Council of National Defense, has recommended to Secretary of Labor Wilson that medical examinations of industrial workers be made one of the functions of the Government's labor recruiting agencies. Accompanying the recommendation is a proposed standard card to be used in making physical examinations. These cards deal with such subjects as laboratory diagnosis, previous occupations, general appearance as relating to deformities, malnutrition, diseases of the eyes, ears, nose and throat, lungs, heart, nervous system, hernia, hemorrhoids, venereal disease, etc. Mr. Gompers' committee further recommends the establishment of a central examining board composed of representatives of the workers, employers, and the Government. It is believed by some that this is opening the way to the early adoption of social health insurance.—News of the Week, *Medical Record*, September 7, 1918, page 421.

Child Labor Bill.—A bill has been introduced in Congress to take the place of the Federal Child Labor Bill recently declared unconstitutional by the Supreme Court. It is said that the bill embodies the standards of the old law very closely, prohibiting the labor of children of less than 14 years at any time, of children between the ages of 14 and 16 years for more than eight hours a day, of child labor at night in factories, and of children of less than 16 years of age in mines and quarries. The bill is based on the war power of Congress to conserve the man-power of the Nation, while the old law was based on the power of Congress to regulate interstate commerce. If the bill becomes a law it will prohibit the employment of children during the war and for a period of six months thereafter.—*Medical News, Jour. A. M. A.*, September 21, 1918, p. 988.

⁂

Swiss Social Insurance and Accident and Disease in Workers.—In the case of accidents Zangger places great importance on the first examination of the case since it often becomes practically impossible for malingering to be detected later. This first examination should include specifications of the status of the person at that time in respect to the cause, outlook and treatment of his injury as well as data on pre-existing disease. The Swiss legislation goes beyond any other in the world in accepting certain sick conditions without visible manifestations as accidents entitling to compensation. In the hands of the physician is placed the chief authority as to the cause of the sickness, as the workman himself very seldom knows what is inducing the trouble and he usually regards as poisonous only substances that smell bad or induce nausea. Sickness, which is exclusively or predominantly traceable to a poisonous substance, ranks with industrial accidents in the Swiss law.—Abstracted by *Jour. A. M. A.*, August 24, 1918, Correspondenz-Blatt für Schweizer Aerzte, Basel.

⁂

Lighting Code.—The New York State Department of Labor has formulated a code relating to the lighting of factories and mercantile establishments, which became effective July 1, 1918, and provides for minimum intensities of light in terms of foot-candles for various kinds of work and various parts of industrial establishments. In an appendix, recommendations are made regarding daylight. The various illumination hazards such as glare, brilliancy, etc., are warned against. In addition to the minimum intensities outlined, a table of desirable standards of illumination is given and also a table of minimum intensities for detailed industrial operations and processes. The code has the effect of a law and a penalty is provided.—*Bull. No.* 18, *N. Y. State Dept. of Labor*, 15 pp.

⁂

Labor Turnover.—Douglass gives several ways of determining labor turnover and for computing this rapid change in personnel even in the face of growth or decay in an industry during the year. The term is a difficult one to define but in general means the number of replacements (separations) which take place in the average working force for a given length of time. Natural turnover due to deaths, estimated at 1 per cent per year, industrial accidents, sickness, and other causes would not be responsible for more than 5 or 6 per cent. Returns from certain large establishments have shown as high as 416 per cent. Turnover for juvenile labor is especially high. Labor turnover is not always an economic waste to the employer for, in the past, wornout or exhausted workmen could be discharged and new ones employed. It is, of course, poor economy from the standpoint of social efficiency. The principal items that enter into the cost of employing new men are: (1) the clerical cost of hiring and firing; (2) the cost of instruction; (3) decreased production by the new worker, which is noticeable continuously where a rapid shifting occurs; (4) breakage and damage caused by new men; and (5) cost of idle machinery where positions are not immediately filled. These vary greatly as to the skill of the workmen concerned, from $8.50 for unskilled laborers to $73.50 for those operatives who require a few months for the proper degree of efficiency. The cost to the Ford Company for 1913 is estimated at $2,000,000. The chief causes for unnatural labor turnover are: (1) poor methods of employment and discharge; (2) poor methods of promotion within the factory; (3) seasonal nature of many industries; (4) juvenile labor; (5) the monotony of modern factory work; (6) low wages, causing workers to regard jobs as makeshifts until they can find others. The remedy lies in employing a specialized employment department which should begin with: (1) physical examination of new employees; (2) a system of follow-up work including a show of friendly interest and an inspection of working conditions and of absence records; and (3) an investigation of the reasons for the successes and failures of individual workmen. A well-defined promotion policy is essential. The department foreman should be stripped of his employment functions and allowed to concentrate his attention upon the actual production of goods. The centralized employment department enabled the Ford Company to decrease its turnover from 416 per cent to less than 80 per cent. Profit-sharing is another method of insuring greater permanence of labor.—Paul H. Douglass, *Amer. Econ. Review*, June, 1918, pp. 306–316.

Prevention of Industrial Anthrax. The British. Departmental Committee appointed to inquire into the best methods of preventing the danger from anthrax infection arising in the handling of wool, goat-hair and camel-hair has recommended the following procedure:

1. A preliminary process, in which the material is submitted to the action of a warm solution of soap in water containing a little alkali, followed by squeezing through rollers for the purpose of causing disintegration of blood clots, removing all protection from the spores and bringing the latter into a condition in which they are susceptible to the action of disinfectants.
2. Disinfection, in which the material already treated by the preliminary process is submitted to the action of a warm solution of formaldehyde in water and again squeezed through rollers, most of the spores being destroyed at this stage.
3. Drying, by which all the surviving spores are killed, except in exceptional circumstances.
4. Standing for a short time in order to ensure destruction of any spores which, from being exceptionally well protected, may have survived the previous part of the process.—*Lancet*, June 15, 1918, p. 848. (*D. G.*)

⁂

Tuberculosis an Occupational Disease?—Infection in tuberculosis takes place in early life and we go through life with the germs in our bodies; but whether or not we succumb depends upon our surroundings, the conditions of our work, and upon our resistance. This resistance may be broken down in many ways. A connection can perhaps be shown between dust in certain industries and this broken down resistance so as to bring the resulting tuberculosis under compensation laws. This has been done in California and should be done elsewhere. Again, resistance may be broken down by excessive fatigue. A low wage scale resulting in poverty is a great cause of tuberculosis.—Abstracts from remarks made by Dr. Alice Hamilton at a Conference of Health Insurance Commissioners in Cleveland, *Hospital Management*, July, 1918, Vol. VI, No. 6, pp. 38–40.

⁂

The Sufferer From Tuberculosis Should Not Work.—The person suffering from tuberculosis who has a maximum daily temperature habitually exceeding 1 degree (99.5 F.) should unquestionably be kept in bed. As has been well said, the patient who begins to exercise has reached a period of danger in his course of treatment.—*Amer. Review of Tuberculosis.*

⁂

Heat Stroke and Cerebral Edema.—Heat stroke occurs as a result of several factors, chief among which is the inability of the air about the body to receive any more moisture because it is already saturated, together with a high temperature of the air. This applies to heat stroke caused by exposure to the sun's heat and also to heat stroke occurring under other conditions, such as hot kitchens and boiler rooms. Less important causes are tight and heavy clothing, and too small intake of water and the excessive consumption of alcohol. The possibility of infectious origin is discussed. The symptoms are outlined and the pathologic anatomy discussed and particular emphasis laid on the appearance of cerebral edema in cases coming under the authors' observation.—McKenzie and Le Count, *Jour. A. M. A.*, July 27, 1918, p. 260

⁂

Sunstroke, Disease or Injury?—The Oklahoma Supreme Court holds that in a case of sunstroke, suffered while the victim was engaged in his usual avocation and when the victim did not intentionally subject himself to an intense heat calculated to produce sunstroke, the affliction was an accident within the meaning of an insurance policy which provided that "if sunstroke, freezing or hydrophobia, due in either case to external, violent or accidental means, shall result, independently of all other causes, in the death or injury within 90 days from the date of exposure or infection, the company will pay said principal sum as indemnity for loss of life."—*Medico Legal Notes, Medical Record,* September 21, 1918, p. 506.

⁂

Freezing is an Accident; Also Heat Stroke.—These opinions rendered by the Supreme Court of Minnesota are abstracted in the Medico Legal Department. The Court sustained the view that the incident of freezing which occurred to a workman in the woods who was not permitted to build a fire, arose out of the employment and came under the compensation laws. References to similar decisions in cases of heat stroke are given.—*Jour. A. M. A.*, May 11, 1918, Vol. 70, No. 19, p. 1397.

⁂

Changes in the Brain in Carbon Monoxide Poisoning.—Hill and Semerak made studies of 32 brains obtained from the post mortem rooms of Cook County Hospital, Chicago, which were chosen only by the one circumstance, that death was due to carbon monoxide poisoning. They found that there is a characteristic type of injury produced in the brain by this cause which can be identified by the pathologist ("namely a bilateral ischemic necrosis of the lenticular nucleus, especially the globus pallidus"). Nerve cells, in themselves, possess a high degree of tolerance to the poisonous action of carbon monoxide. That such poisonings are a cause for the subsequent development of nervous and mental diseases as well as for deaths which may not be explained easily, received emphasis from this study.—Emery Hill and C. B. Semerak, *Jour. A. M. A.*, August 24, 1918, Vol. 71, No. 8, pp. 644–648.

⁂

Mental Symptoms of Carbon Monoxide Poisoning.—Memory defect stands out as the most important nervous symptom following the inhalation of carbon monoxide. It is pointed out that the brain of a soldier, dead from shell shock, and the brain of a man, dead from carbon monoxide poisoning, show a marked similarity, particularly in the corpus callosum which shows numerous capillary punctate hemorrhages. Five cases are cited and discussed.—C. W. Hitchcock, *Jour. A. M. A.*, July 27, 1918, pp. 257–259.

⁂

Cyanamid Poisoning (Artificial Fertilizers).—Langlois calls attention to the serious danger for workers on calcium cyanamid if they take an alcoholic drink. A small glass of wine is liable to send the pulse up to 104 and the blood pressure extremely low with rapid breathing. The man, in a typical case described, had a fainting spell after drinking about one ounce of red wine. The spell returned whenever he raised his head, and nausea and extreme reddening of the face and eyes were pronounced. The blood pressure kept very low for an hour, but by the end of the eighteenth hour there were no further signs of disturbance.—Abstracted by *Jour. A. M. A.*, September 7, 1918, p. 858, from Bulletin de l'Académie de Médecine, Paris. (Langlois' findings are in line with those of one of us—Hayhurst—reported in 1915 in the "Ohio Survey of Industrial Health Hazards and Occupational Diseases," page 349, where, in the mixing and grinding of certain fertilizers, "one workman claimed that there was a peculiar effect produced by the drinking of beer while breathing cyanamide dust which caused headache, giddiness and nausea.")

⁂

How Industrial Fatigue May Be Reduced.—The Divisional Committee on Industrial Fatigue (Council National Defense) notes the following ways of detecting fatigue: (1) Amount of output, by keeping a record of the employees' work by the hour or day; (2) amount of power used; (3) certain indicators such as the amount of spoiled work, the number of accidents, the number of absences, and, in extreme cases, by records of sickness; and (4) laboratory tests of fatigue. The ways of reducing fatigue are summarized as (1) introducing recess periods with perhaps a little food or a cup of tea or cocoa; (2) introducing variety into the work; (3) adjusting the speed of machinery to the average pace of the workers and transferring workers who are especially fast or slow to other work; (4) omitting unnecessary motions as in reference to height and distance which articles must be moved by the hand; (5) providing adjustable seats, perhaps with foot rests; (6) ventilation of work rooms, especially in reference to avoiding excessive heat and humidity, which puts the body in a feverish state. "It is astonishing how easily a comfortable and refreshing bodily condition may be maintained by the use of electric fans"; (7) sanitary conditions within factories, including lighting, exhaust systems for dust and fumes, proper drinking facilities, rest rooms, especially for women, canteens, and clean, well-ventilated, modern toilets; (8) alternating day and night work. The day sleep of night workers is likely to be curtailed and thereby fatigue produced in this group of workers. Studies show that where night work is unavoidable, workers should be alternated at intervals between day and night, the periods to be not less than one month in duration; (9) adjusting hours of work. This is particularly in the direction of decreasing 12 and 10 hour workdays, although the exact relationship between length of day and quantity of output is not yet fully investigated for all conditions, but the great preponderance of evidence favors a reasonably short working day even in the interest of the industries themselves; (10) avoiding overtime, or where necessary, not for many days in succession; (11) omitting Sunday work; (12) controlling sanitary conditions outside factories. In conclusion the Committee states "should any industrial corporation that is now engaged in manufacturing war supplies desire the services of the Committee, communications should be addressed to the Executive Secretary at the office of the Committee, 437 West 59th Street, New York City."—*Public Health Reports*, U. S. P. H. Service, August 16, 1918, Vol. 33, No. 33, pp. 1347–1355.

⁂

Trinitrotoluene Poisoning.—The London correspondent dwells upon a remarkable feature of this disease in the length of time that may elapse between absorption of the poison and the development of jaundice or anemia. The most extreme case reported was that of a woman, who, after two months' work in processes in the manufacture of this explosive, was transferred to another department. Over seven months later a spanner fell on her head. Toxic jaundice developed a week later and proved fatal in a fortnight. Exhaust ventilation locally applied proves to be the best prevention in the workplace. Gloves were reported as more of a source of danger than a safeguard. Respirators proved an impracticable remedy.—*Jour. A. M. A.*, August 24, 1918, Vol. 71, No. 8, pp. 678.

PUBLIC HEALTH LABORATORY NOTES

Abstracted by Arthur Lederer, M. D.

Method of Preparing Medium for Culture of Influenza Bacillus.—The method consists in the use of blood digested by trypsin. The blood used need not be fresh, but may be well citrated blood that has been kept in an ice chest. The medium grows influenza freely from the first culture and it is to a marked extent selective. Thus it inhibits pneumococci entirely and in a large measure streptococci and other Gram-positive organisms, but apparently favors staphylococci. The colonies of influenza bacilli on initial culture attain a large size.—John Matthews, *Lancet* (*London*), 195, 104 (1918).

⁂

The Growth of Bacteria in Protein—Free Enzyme and Acid-Digestion Products.—Apparently the first protein-free medium which compared favorably with the universally used peptone medium was the opsine studied by Dalimier and Lancereaux (Presse Med. 21, 419). Opsine is a biuret-free product resulting from the combined action of trypsin, erepsin and pepsin on certain protein materials. Glycerol and agar added made a very successful medium for even the most delicate organisms. The authors substantiated these claims made originally. Opsine proved superior to Witte's peptone. A reaction slightly alkaline to litmus was found to be best for general use. The opsine was obtained from Paris. It resembles highly concentrated commercial meat extract. The addition of 0.5 per cent Liebig's meat extract to neutral opsine agar yields superior results.—Harold C. Robinson and Leo F. Rettger, *Jour. Bact.*, 3, 209 (1918).

⁂

Intradermal Vaccination against Smallpox.—A comparative study of 227 cases, with all conditions equal, showed that vaccination by the intradermal method gives a much higher percentage of "takes" than vaccination by the incision method. There is less chance for infection and it is the only method by which a fair index of the relative immunity of persons to smallpox may be obtained.—L. T. Wright, *Jour. Am. Med. Assoc.*, 71, 654 (1918).

⁂

Further Experiences with Brilliant Green Agar and Other Mediums for the Isolation of the Typhoid Group from Feces.—The brilliant green medium has markedly increased the number of positive fecal examinations for typhoid and paratyphoid bacilli. The methods of preliminary and final identification previously recommended have been found reliable. The essential point in the success of the medium is proper standardization. Of the recently suggested non-restraining plating mediums, Robinson and Rettger's modification of the Endo agar has given a far superior contrast between lactose and non-lactose fermentative types than that obtainable with the various modifications thus far tried.—Charles Krumwiede, Jr., L. A. Kohn, A. G. Kuttner and E. L. Schumm, *Jour. Inf. Dis.*, 23, 275 (1918).

⁂

Studies on Bovine Mastitis.—Hemolytic streptococci produce more or less severe inflammations of the udder of cows. The streptococci isolated from the invaded quarters have produced clear zones of hemolysis immediately surrounding the colonies when cultivated in horse blood agar plate cultures. The streptococci fall into two broad groups according to their action upon carbohydrates. All streptococci except three were agglutinated by an antiserum obtained from a rabbit immunized with a single strain. Freshly isolated cultures when injected intravenously into rabbits possess but slight pathogenicity.—F. S. Jones, *Jour. Exp. Med.*, 28, 253 (1918).

⁂

Active Immunization of Infants against Diphtheria.—Zingher would have all infants below twelve, and if possible below eighteen months of age, actively immunized with three doses, each 10 cc. of toxin-antitoxin, one week apart. These injections should be given irrespective of the Schick test the infants may show at the time of immunization. The injections are given subcutaneously in the arm or below the angle of the scapula, and repeated every seven days. All children over eighteen months of age, as well as all youths and adults, should be tested with the Schick reaction first, and only those giving a positive reaction immunized with toxin-antitoxin. The mixture used should be slightly toxic and should represent about 85 per cent of a lethal plus to each unit of antitoxin. The active immunization against diphtheria should be carried out first of all by the private physicians in the different homes, where a majority of the infants can be reached. In cities of large population the milk stations, day nurseries, children's dispensaries, infant and orphan asylums furnish large groups of children suitable for immunization.—A. Zingher, *Am. Jour. Dis. Children*, 16, 83 (1918); *Jour. Am. Med. Assoc.*, 71, 849 (1918).

⁂

Complement Fixation with Specific Antigen in Acute Poliomyelitis.—The author describes the mode of preparation of the antigen and procedure of fixation test. One hundred and fifty-two spinal fluids and 60 blood serums were examined; 53.5 per cent gave a positive, 27.9 per cent a doubtful, and 9.5 per cent a negative reaction. It would appear that an antigen has been found which probably is specific and fixes complement, hence of positive diagnostic value in poliomyelitis.—M. Neustaedter, *New York State Jour. Med.*, 18, 328 (1918).

⁂

Improved Technic for Embedding in Paraffin.—The author accomplishes the same purpose as the usual water and alcohol technic by placing the specimen—dried between blotting paper and not rinsed—directly in the mixture consisting of 10 parts of pyridin, 40 parts chloroform and 50 parts acetone. These ingredients are mixed cold beforehand; the amount used is about twenty times the volume of the specimen. The latter is suspended by a thread in the mixture in a test-tube or other vial, and is left in the fluid for from ten minutes to one hour according to size. The fluid is then poured off and fresh used for a second bottle for the same length of time. The specimen is then transferred directly into the paraffin. Specimens treated by this rapid method take stains as usual, and the specimens keep perfectly.—C. Dunet, *Lyon Medical*, 127, 256 (1918); *Jour. Am. Med. Assoc.*, 71, 859 (1918).

⁂

Continued Elimination of Bacilli Following Typhoid Fever.—Carriers of the paratyphoid A and B bacilli react in the same way as typhoid carriers. The passage of the bacilli from the gall-bladder into the intestine is usually periodic. On the other hand, rectal elimination is generally continous and in large quantity. The paratyphoid B organism is rarely eliminated by the kidney. Some subjects carry the organism in the throat. Most of the carriers have had at some time in their history a typhoid fever or some septic affection. The continued elimination of bacilli tends to become permanent for months or years, and about 25 per cent of the subjects recover spontaneously during the first six months following their recovery. Cholecystitis is to be regarded rather as a result of microbic elimination than the cause. The entire number of carriers should be estimated at from 3 to 5 per cent of those who have suffered from the disease.—Reibmayr, *Muenchener med. Wochenschrift*, June 18, 1918; *Medical Record*, 94, 427 (1918).

⁂

Bruck's Reaction with Serum and Cerebrospinal Fluid.—The test was applied with the serums of 100 persons, the majority of whom were under treatment for syphilis. Wassermann and Bruck tests with 94 serums (the Bruck tests being conducted with fresh active serums) yielded similar results with 65 serums, or about 70 per cent. The Bruck test was found to yield presumably about 8 per cent falsely positive reactions. The active serum is better adapted for the test than inactivated serum. —I. Toyama and J. A. Kolmer, *Jour. Cutan. Dis.*, 36, 429 (1918); *Jour. Am. Med. Assoc.*, 71, 928 (1918).

⁂

Bacteriological Methods for Determining the Quality of Milk.—The reaction of the agar used in plating the milk for bacteriological count influences the results obtained considerably and in order to standardize the method, it is recommended that the agar be made up with a reaction of 0.5 acidity. Experiments were carried out at four degrees of acidity—0, 0.5, 1.0, and 1.5, and in nearly every instance the highest results were obtained at 0.5 acidity. Several references to the literature on this subject are given.—J. M. Sherman and F. P. Reynolds, *Penn. State Coll. Expt. Sta. Ann. Rep.*, 1914–15, p. 294; *Chem. Abst.*, 12, 1569 (1918).

⁂

Volumetric Determination of Calcium in Water.—The sample of water is shaken with an excess of 8 per cent ammonium oxalate solution and allowed to stand ten to fifteen minutes; filtered through a dry filter into a dry receiver. An aliquot part of the filtrate is acidulated and titrated with 0.1 N potassium permanganate. A "blank" is run with distilled water using the same pipette to determine the total reducing value of ammonium oxalate in the aliquot used. From the difference in permanganate used the calcium content is calculated.—Grossfield, *Z. Nahr. Genussm*, 34, 325; *Chem. Abst.*, 12, 1578 (1918).

⁂

A Prophylactic and Curative Serum for Weil's Disease.—A serum has been prepared whose curative virtue is considered absolute. It has been noted that the blood-serum of animals and man infected with icterogenous spirochete contains antibodies which persist for seven months, two and one-half years or even twenty years after recovering from the disease. The method of preparation of the serum is given. The serum has a distinct curative power when injected at the beginning of the disease, before icterus has appeared, if employed in the dose of 50 cc. injected into the muscle or intravenously.—

Uhlenhut and Fromme, *Deutsche med. Woch. schrift*, June 27 (1918); *Med. Rec.*, 94, 472 (1918).

✽

Wasserman Test.—A full description of the Wassermann test in use at the Hygienic Laboratory of the United States Public Health Service appeared in *Public Health Reports*, Aug. 23, 1918. The article was prepared by M. H. Neill, Passt Assistant Surgeon, U. S. H. S.

✽

Determination of Albuminoid Ammonia in Liquids Containing Gas-liquor.—Thiocyanates must be removed before albuminoid ammonia can be determined in liquids containing gas-liquor, since thiocyanate yields ammonia when heated with alkaline permanganate solution. A definite volume of the sample (which should be alkaline) is treated with a quanity of aluminium sulfate sufficient to give a decided precipitate, filtered through an asbestos filter, the filtrate acidified with nitric acid, the thiocyanate precipitated by the addition of silver nitrate, and the mixture again filtered. The filtrate is then distilled in the usual way. A control determination should be made in distilled water to which a small quantity of thiocyanate has been added and a corresponding correction applied to the results obtained; the correction is practically constant.—H. F. Stephenson, *Analyst*, 43, 215 (1918); *Jour. Soc. Chem. Ind.*, 37, 439a (1918).

✽

Toxic Action of Carbonic and Other Weak Acids on the Meningococcus.—The meningococcus survives exposure to Ringer-Locke solution. Sodium bicarbonate (0.02 and 1.0 per cent) in sodium chloride solution exerts a toxic effect on exposures of 60 minutes; a 2 per cent solution has no toxic effect. The toxic action of serum through which carbonic acid gas has been passed is pronounced. It is suggested that normal solutions containing increased amounts of carbon dioxide, or lactic acid may as physiological antiseptics be employed in the local treatment of areas infected with meningococci, and that even the carbon dioxide normally occurring in the plasma and body fluids may form part of the protective processes of the body.—J. A. Shaw-Mackenzie, *Jour. Royal Army Medical Corps*, 31, 1 (1918).

✽

Value of the Wassermann Reaction.—A comparison of the serological and autopsy findings at the Presbyterian Hospital, New York City, during the past three years brings out the following facts:

First: Among cases showing anatomical evidence of syphilis at autopsy 85.7 per cent had given during life a "four plus" Wassermann with both alcoholic and cholesterinized antigens.

Second: Among 188 cases showing at autopsy no anatomical evidence of syphilis, 93 per cent had given during life a negative Wassermann with both antigens and 7 per cent doubtful reactions. The authors conclude that the Wassermann test, properly carried out, can be relied upon as an important aid in the diagnosis of syphilis.—R. A. Lambert, Miriam P. Olmstead, H. C. Stuart, *Med. Rec.*, 94, 452 (1918).

✽

Second Report on Bacteriological Aspects of the Meningococcus Carrier Problem.—Two sera would suffice for serological typing for the greater number of strains provided that the one was a typical Group I and the other was a typical Group II serum. There would remain some strains which were not reacted upon by either serum. The two sera employed in different laboratories would probably not be identical, as the range of activity of these sera depends to a very large extent on the particular strains used for immunization. Irrespective of cultural tests, agglutination is not sufficient, because other organisms, *e. g.* the gonococcus, may agglutinate with a meningococcus serum. A positive result of the absorption test is confirmatory, but absorption capacities are too irregular to justify any diagnostic significance from negative results. The absorption test proves nothing when the result is negative. Serological tests are not required to decide whether an organism is or is not a meningococcus. Cultural tests, if adequately performed, suffice.—Arthur Eastwood, *Jour. Hyg.*, 17, 63 (1918).

✽

Second Report on the Indentification of the Meningococcus.—The serological characters of 66 strains of meningococci obtained from the cerebro-spinal fluid in cases of meningitis have been studied. Serological tests of a similar nature have been applied to 86 strains of Gram-negative cocci, culturally identical with meningococci, obtained from the naso-pharynx of non-contacts. The majority of spinal strains can be divided into two main-groups by simple agglutination tests with selected spinal sera. The naso-pharyngeal strains produce active agglutinating sera for spinal strains. The naso-pharyngeal strains are not serologically separate and distinct from the cerebro-spinal strains. There is no justification for the view that naso-pharyngeal meningococci of the non-contact differ as a class from strains which might be found within the immediate environment of cases of the disease. Meningococci form a well defined species of Gram-negative cocci and can be identified in the naso-pharynx by careful application of cultural and fermentation tests.—Fred. Griffith, *Jour. Hyg.*, 17, 124 (1918).

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FRATERNAL ORDERS AND THE AMERICAN PUBLIC HEALTH ASSOCIATION.

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Treasurer, American Public Health Association, New York City.

Address before the National Fraternal Congress at Philadelphia, August 26, 1918.

I HAVE been waiting for almost ten years for an opportunity to meet and to address representatives of the fraternal orders of the United States and Canada. Just about ten years ago, when I was connected with the Russell Sage Foundation, I began a study of fraternal insurance for that Foundation. It has always been a matter of regret to me that the study was never finished. Only recently, I had occasion to look over some of the data which were collected at that time from the questionnaires which you or your predecessors were kind enough to fill out for me; and I was amazed to find that the data had grown obsolete in ten years—that the strides made in this country in the intervening period had been so great that the publishing of the statistics now would be useless.

Your President has spoken accurately in saying that the thing that we must develop in the United States is not primarily insurance against known hazards of life, but rather to try to reduce those hazards. Should not the proposition of paying compensation or benefits for unnecessary sickness and preventable accidents be discontinued? To my mind, it is fundamental in any insurance scheme, to see whether the efforts of the organizations preaching the doctrine of insurance protection, cannot eliminate the necessity for the further extension of these organizations. I should like to see the time come when there will be no need for sickness insurance, when we shall have eradicated all preventable diseases, and the only sickness known, shall be the sickness of normal old age; and when we shall cut down our mortality to such an extent that insurance companies will pay claims only at ninety-nine years of age.

Now if you give that matter a thought, and there is a very serious side to it, it may interest you to know just what has been done in the control of mortality. I listened with interest to Doctor Clark, when he roused you to the point of a resolution by telling us of the awful things happening on the Western front to our Canadian brothers and to our own boys; and without thought of speaking in any but a respectful manner, I would say that I wonder whether we would have been aroused to such a pitch of hatred, of feeling that something must be done, if we had been told that equally as many persons in civilian life had died from disease. If we had been thus roused our attitude would have been in marked contrast to the indifference toward sickness prevention all of us have displayed during the last few decades. It is no exaggeration to say that we have sat by almost apathetically, taking sickness as a visitation of God. I can take you to certain sections of the country where women still believe that children must go through certain children's diseases—that they must have whooping-cough, diphtheria, measles, etc., in order to become healthy adults. We have sat by, all these decades accepting these conditions as inevitable and have done practically nothing to improve them.

Now, have they been improved? May I tell you some of the facts? In 1880, the mortality in the registration area from all causes of death was 19.8 per thousand persons. That death-rate has been cut down. In 1916, it was just 14.0. The mortality from typhoid fever in the period from 1901 to 1905 was 32.0 per hundred thousand. In the year 1916, it had dropped to 13.3 per hundred thousand. Through the efforts of the fraternal orders? Through the efforts of the insurance companies? No. Malaria has gone down from 4.8 in the period 1901 to 1905 to 3.0 in 1916; smallpox, from 3.4 to 0.2. Smallpox is becoming a comparatively rare cause of death in the United States. The rate for diphtheria and croup fell from 29.6 to 14.5; and even the figure for tuberculosis of the lungs dropped from 170.7 to 119.4 per hundred thousand persons exposed.

I ask the question again, and I ask it frequently, who is responsible? If there is any fraternalist here who can honestly say that it is due to the efforts of the fraternal orders, I shall be glad to be enlightened. Speaking as an insurance man, I can say that it is not due to the efforts of insurance companies. In other words, we have sat contentedly by and allowed a big movement to go on, accepted the benefits and fruits of the movement, and have not raised a hand to help it. I wonder whether your current rates would be adequate if the mortality you expected twenty-five years ago were maintained today.

Who has done it? You have not. We know that the insurance companies have not. There is not an insurance company, to my knowledge, that has attempted to do more than formal things, and those only in very recent years, in this campaign for the prolongation of human life. It has been done by a few trained men; by men coming from Canada, the United States, Mexico and Cuba; sanitarians, health officers, bacteriologists, laboratory men and sanitary engineers who came together, originally fifty years ago, and formed themselves into an organization called the American Public Health Association. These men, to my mind, made one great mistake. They hid their light under a bushel. Their organization has been made up almost exclusively of technicians. Yet their deliberations, the reports of their committees, the work done by their members, stamped out yellow fever in Cuba and in the United States; has cut down the ratio of deaths from diphtheria, typhoid fever, tuberculosis, measles, whooping-cough and other preventable diseases from the high rates in 1870 and 1880 to what they are today.

This organization, gentlemen, is made up of a membership of approximately two thousand. It represents, as I stated, four countries. Its present President is a Canadian, Doctor Hastings, the health officer of Toronto. One of its other officers, Doctor Bryce, is also a Canadian. One Ex-President, Doctor Evans, is from Chicago. Practically all the men whose names you are reading in the papers today, who are coöperating with this government in improving the sanitation of the army camps here and abroad, are listed among its members.

This organization comes to you now and asks you to realize that it is doing your work; that if you are paying relatively fewer death claims today than twenty-five years ago, the American Public Health Association is responsible in part for it; that if typhoid fever is gradually disappearing, it is due to the work of the engineering section of this association in establishing proper standards of filtration, proper standards of chlorination, proper means of carrying out advantageously steps such as were taken in Cincinnati where the typhoid fever death-rate declined from 79.2 in 1904 to 3.2 per 100,000 in 1916, and in Pittsburg, from 144.3 in 1900 to 9.0 in 1916. This organization comes to you in connection with your health conservation committee, and says, "Be a part of us." We have the trained men. We have in our organization practically every important health officer in the United States and Canada. We realize the opportunity for this organization in the coming years, particularly in view of the need of preserving the health, not only of the army, but of the civilian population that remains behind. The opportunity for this organization becomes greater and greater. We have everything but money. We need the sinews of war. We have an ambitious program laid out, which includes the education of the public health officers in the smaller communities, the attempt to secure in every city full-time health officers, the obtaining of adequate salaries for these officers, and the securing of sufficient appropriations for public health work in every community. We contemplate publishing a popular health magazine. We have a journal now, but it is technical; and we want to have one that shall correspond with the *National Geographic Magazine.* We contemplate encouraging the establishment of schools for the education of health officers, and we have already organized state health sections.

Here is our program. Here is your opportunity to come in. We have a corporate membership, under which any organization may join by paying fifty dollars and upwards annually. If the six million members (and probably there are more in the fraternal orders) were to contribute one cent a-piece, we could carry on a campaign through the medium of this organization, that, I am sure, would, in the next ten or fifteen years, markedly reduce mortality from preventable diseases and the diseases of middle life; and if that can be done, what does it mean for you in the last analysis? That you will be able to sell insurance cheaper than you can now; that your mortality table will unquestionably be adequate.

This matter was presented last February at the meeting of the Association of Life Insurance Presidents by Doctor Hastings; and at that time, a resolution was passed by that Association recommending that the individual companies in the Association become members of the American Public Health Association. It is very gratifying for me to be able to report today, that, as the result, we have obtained the membership of a number of insurance companies, who are paying from one thousand dollars to one hundred dollars per annum. A campaign is now being carried on among the smaller life insurance companies.

You should realize that the American Public Health Association is your organization, that it is represented in every town in this broad country; that the work it is doing in popularizing and developing the knowledge of public health is done for you and for your constituent bodies; and that opportunity would be given in the association, and in the annual program of the association, to discuss health problems of fraternal organizations.

I am leaving this matter in your hands. I have no thought of dwelling on the seriousness of the outlook in this country regarding health conditions with the present shortage of nurses and physicians. It is already apparent that the conditions are worse than they were a year ago. The available mortality records of American cities last year showed, for the first time in years, an almost stationary death-rate from tuberculosis (in some cases an actual increase), after all the splendid campaigns that had been waged against the disease. Apparently the fact that men and women are working under more strenuous conditions, or when they should not work at all, has checked the downward trend of the death-rate for this disease. Unless the campaign carried on by the Federal Children's Bureau is consummated, there is likelihood that there will be an increase in the death-rate among children. It is probable that there will be an increase in the death-rates of other diseases. This is of interest to you as the guardians of the fortunes of millions of men and women, who repose their trust in you. I feel quite confident that I may leave this matter of active participation in the work of the American Public Health Association in your hands, with the assurance that you will give it fair and just consideration.

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A Program for Maternity Care.—The work that is being attempted in one small district in New York is an experiment only in that it is an effort to cover completely the need for maternity care, prenatal, delivery and postnatal, in a given community, by providing for every woman in that community medical supervision and nursing care from the beginning of her pregnancy until her baby is one month old. This is being attempted, not by establishing another medical and nursing agency, but by establishing a center through which the maternity work of every hospital, private physician, midwife and nursing agency in the community may be coördinated and developed to its fullest extent; a center at which there will be a complete record of every pregnancy in that district; a center from which the whole community may be educated to realize the need of and to demand adequate medical supervision and nursing care for every woman and her baby before and after birth.

The prenatal nursing is done by a combination of visits to the patients in their homes by the nurses of these agencies, and by the patients' visits to the nurse at the Maternity Center. This plan was adopted first for the sake of enabling fewer nurses to care for more patients, by having the patient do the traveling. It is of advantage to the patient in many ways to come to the Center, because they can be shown a model of the baby's bed, a model mother's bed at the time of delivery, material for making baby clothes, bought at wholesale, and sold to the mothers at the same price, patterns for making these baby clothes and people to help the women cut out the material and put it together. Every week a mothers' meeting is held where the women come and knit, one hour for the Red Cross and another hour on something for their own babies.—Stevens, Anne, *The Public Health Nurse*, September, 1918, p. 95. (*D. G.*)

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Annual Meeting, A. P. H. A., Chicago, Ill., December 9-12, 1918
Come, and Bring a New Member

FASHIONS AS AFFECTING PUBLIC HEALTH.

JEANNETTE THROCKMORTON, PH. B., A. M., M. D.

To be read before the Public Health Administration Section, American Public Health Association, December 9–12, 1918, at Chicago, Ill.

THERE are fashions not only in dress, but in trend of thought and morals. Our primitive ancestors, living in warm climates, needed and wore no clothes, and it was really vanity which brought dress into being. For dress, before it was a protection or covering, was a decoration. It was the visible mark which set a man above his fellows. The primitive champion coming back from a hard fight with blood upon him, found himself admired by the women of his tribe, and envied by the men. Finding that this mark of battle gave him distinction, the conqueror let the blood remain on him as long as it would, and when the dried blood wore away, the scar remained as a mark of distinction. To this day, certain savages strive for conspicuous scars. And not only recognized savages, so also German students with their dueling scars. This doubtless is a reversion to atavistic tastes. Primitive man then set about to improve Nature and supplement accident. Red pigment closely resembling blood in color, was daubed on faces and bodies; the daubings became in time symmetrical and in regular patterns. The male for ages was the "dressy sex," and primitive woman leaned toward the man who displayed the most ornaments, such as bright stones, teeth of big game and scalp locks of his victims. So it is evident that dress was first adopted for vanity; then found necessary for protection as man pushed north and south in the conquest of the world; and lastly, as civilization crept forward, dress became a symbol of modesty.

Of these three impulses toward dress, that of protection seems most often disregarded by the gentler sex. Man being blessed with brains was expected by Nature to dress according to the climate in which he lived; hence she did not provide him with an extra coat of fur during the winter, as she does the lower animals. But we do not live up to her expectations! The majority of young girls who come into my office in winter, are half-clad, from choice rather than necessity. This condition prevails also among college girls in my state, as I personally know, and I presume feminine nature is no different in your respective states. I deplore this custom of the past few years of keeping our houses at summer heat and wearing no underwear in winter. The change from summer heat to zero weather is too extreme, and on stepping outdoors the body is at once chilled. The continual chilling of the skin causes congestion of the internal organs with many attendant ills. When I see young girls on the streets with their necks bare to winter winds, I find myself computing how many of them by such exposure are making themselves liable to future tuberculosis. The apices of the lungs, being constantly chilled and congested, offer a pleasant habitat for tubercle bacilli, who, never slow in accepting any harbor offered them, quickly invade this favorable territory. The streptococcus viridans has also encouragement to enter the human system, when continual "colds" cause abnormal condition of tonsils and pharyngeal and nasal membranes; and the resulting "rheumatism" teaches its possessor the lesson that lowering body temperature subnormally lessens natural resistance to germs. So also, the pelvic congestion incident to insufficient clothing about hips and limbs, is an important factor in dysmenorrhea, amenorrhea and the simple anaemia so often seen in our adolescent girls.

Aside from the health standpoint, we want to be patriotic. The coal problem is an important one. "The present shortage of coal will actually improve our health," says Professor Huntington of Yale University, who investigated some sixty millions of deaths and arrived at the conclusion that "an average temperature of 64° is best for physical activity, while for mental activity a temperature not above 50° is most favorable." He states that the death-rate is higher in winter; not because of the cold air outside, but because of wrong air conditions inside the house, namely: too high a temperature and air too dry. The hot air of our furnace heated houses dries up the mucus membranes so we are more susceptible to colds and respiratory diseases. He advises the American people to put on more clothes and use less coal, and keep the air in their houses cooler and more moist.

To continue with the feminine garb. The erect posture assumed by man, makes extra demands on the ligaments supporting the abdominal organs. If the abdominal walls have a normal amount of adipose tissue, and the abdominal muscles and visceral ligaments have their natural tonicity, no additional support to the visceral organs is necessary. But few have this ideal condition, and since some form of corset will be worn by the majority of women, it should at least prevent rather than cause or exaggerate ptosis. Some authorities consider Splanchnoptosis as essentially a costume deformity; and it is true that the corset worn by the majority of women tends to produce that ideal of feminine beauty of the age of hoop-skirts and the Civil War period. But gradually there is coming into use the corset known as the 'straight front,' which gives the desired upward and backward pressure on all the viscera and which fits snugly at the hips and loosely at its upper extremity. This type of corset is built on scientific lines and is of much benefit in movable kidney and visceral ptosis and has been well described by Reynolds and Lovett.

Looking at the support of the abdominal viscera from another point of view, we see the cervical fascia, attached to the base of the skull, continued downward as the pericardium, giving support to the dome of the diaphragm. From the diaphragm is suspended the stomach by means of the liver and the lesser omentum. Goldthwait lays considerable stress on the importance of the cervical fascia, which "through its continuation (the pericardium) forms a suspensory ligament from the diaphragm." He has demonstrated that putting the cervical fascia on the stretch, by throwing the head backward, will raise the stomach three to four inches. In the round-shouldered individual there is a lack of tension on the cervical fascia, a dropping of the dome of the diaphragm, and therefore a prolapse of the stomach and transverse colon, aided of course by the relaxed abdominal muscles. Hence we see the necessity for a soldierly carriage and erect chest, and the need to discourage the droopy walk that our girls have imitated from the fashion sheets for the past few years. One good thing which will result from this war, I hope will be the fashion to walk erectly and properly.

But we cannot have proper carriage or gait, unless we have a suitable shoe. The majority of shoes worn by young women are improper in shape and cause faulty posture. They are too narrow and too pointed, and the high heel set with its bearing surface underneath the arch of the foot, is pernicious. The foot naturally is supported on the heel and the heads of the first and fifth metatarsal bones. Normally the great toe is slightly adducted in walking, and there should be a space between it and the second toe about equal to the width of one of the small toes, as we see in infants. The fashionable shoe causes "hallux valgus" according to Dr. Tubby, as it crowds the great toe outward causing the second toe to over or under-ride its fellows, and exposing the metatarsal-phalyngeal articulation to pressure and the formation of bunion. The high heel causes the foot to slide forward, preventing all motion of the toes so essential to the preservation of the arch. Thus flat foot results, by the shifting of the body from the center of the astragalus to the inner side of the foot, and turning the foot outward and weakening the plantar structures. Metatarsalgia results from pinching the plantar nerve between the heads of the metatarsal bones, and is caused by a shoe too narrow. We encounter difficulty when an attempt is made to change suddenly into a shoe which gives proper freedom in walking, and has a wide flat sole, straight inner side and low broad heel. The tendo Achillis is found shortened by the continual elevation of the heel (incipient pes equinus), the great toe is extended upward; therefore a change back to a proper shoe has to be made gradually and the heel gradually lowered, and the patient reëducated in walking. Every shoe store is ready with various appliances to correct the very defects which the modern shoe causes. If we could only change the fashion in shoes, we would do away with these appliances and markedly increase the efficiency of the vast army of young women now engaged in public service.

In connection with dress and intimately associated with it, comes that subject now demanding so much attention in magazines and mothers' clubs, Social Hygiene. Morals and dress are intimately associated and never before has modesty in dress seemed so little in demand among our young girls. The customary street dress of last summer was an offense to one's finer sensibilities: with its abbreviated skirt, shoes designed to attract the eye—hose likewise—the thinnest of crepe waists with only a little ribbon and lace underneath, and cut so low in the neck as to be indecent. Who is at fault when our young girls wear such clothes? I believe it is the women—the good women—of our country who are to blame, because they do not frown upon such vulgar costumes and refuse to let their young daughters wear them. The adolescent daughters, having instincts and impulses which they do not understand, often use poor judgment not only in clothes but in conduct, and they need wise guidance and sympathetic help. The mating instinct is strong during adolescence and we must recognize this fact with sympathy. The period of adolescence is a trying one under any circumstances, and is especially so during these war conditions. We must teach our girls that they have a responsibility toward young men. We must teach them that it is true patriotism to train and control their emotions and impulses; and impress upon them that a great factor in accomplishing this end is to dress so as not to attract or arouse the sex passion; instead, by womanly qualities, to appeal to the better side of a man's life, wherein he respects and reveres the name of woman. We must teach our sons that they too have a responsibility toward womankind, and that any foolish unsophisticated girls who fall their way, are not their legitimate prey. We must teach them, that at this time when the whole nation is striving for efficiency in every activity, when every resource of the country is called into service, that true patriotism demands that they should observe social morality and self-control; so that, unhampered by disease, they may give to their country their best and finest efforts and splendidly uphold America's promise of Liberty: "That every nation, God willing, shall have a new birth of Freedom, and that the Government of the people, by the people and for the people shall not perish from the Earth."

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A CRITICAL STUDY OF THE BACTERIAL COUNT IN WATER AND SEWAGE.

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To be read before the Laboratory Section, American Public Health Association, December 9–12, 1918, at Chicago, Ill.

THE bacterial count is one of the most generally used measures for the sanitary phases of water supply and sewage disposal questions. By means of it we gauge the pollution of a water, the strength of a sewage, the efficiency of a process of purification or disinfection, and the purity of the effluent. Doubtless we are assisted in our judgment by other indications, as, for instance, the coli test in the case of water supplies.*

All the details of the bacterial count have been subjected to considerable study and the whole procedure has been standardized, wherefore it rightly enjoys a great degree of confidence, but because of this confidence its use is often extended far beyond its scope unquestioningly, and the results obtained are taken at face value by many competent sanitary engineers.

If we inquire into the interpretation which we ordinarily almost subconsciously place upon this test, we find this to be that it represents *all the individual bacteria* in a cubic centimeter of the liquor examined. The fact that this is not true, when known, is generally reconciled by the vague conception that the number indicated is directly proportional to the total number present.

The causes which operate to make the observed results differ from the true or desired results may be grouped as follows:

1. Those arising from mathematical considerations based on the laws of chance.
2. Those due to errors or imperfections in the manipulation and technique of the test.
3. Those due to clotting of bacteria, or their adhesion to or occlusion in solid particles, causing a number of bacteria to produce but one colony.
4. Those due to failure of bacteria to grow because of unsuitable conditions.
5. Those due to accidents, such as death of bacteria, juxtaposition causing several to appear as one colony, etc.

It will be noted that causes 3, 4 and 5 all tend to reduce the bacterial count. Cause 2, while present with the best technique, may assume very large proportions in incompetent hands, and unfortunately it is usually impossible to verify the details of testing *a posteriori* so that results must be taken at their face value.

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* An article on the mathematical interpretation of the coli test by the same author appeared in the *Engineering News*, May 24, 1917.

Mathematics of the Bacterial Count.

In considering the mathematical aspects of the bacterial count, it is well to impose certain restricting conditions:

1. It will be assumed that we are dealing with a single fair sample, eliminating all consideration of periodical and secular variations.
2. It will be assumed that the sample is well mixed and that all bacteria are free to move about, so that a reasonably uniform distribution of the bacteria throughout the sample is obtained.
3. That the plate count shows all the bacteria plated and intermediate errors are eliminated.

We may consider the sample to be composed of a large number of minute droplets, each the size of a bacterium, and interspersed with these the bacteria themselves.

If we consider that a one cubic centimeter sample pipetted off for plating contains s such particles, of which α are bacteria and β are droplets of water, then:

The probability that any such particle is a bacterium

$$=p=\frac{\alpha}{s} \tag{I}$$

the probability that any such particle is a water droplet

$$=q=\frac{\beta}{s}=1-p \tag{II}$$

Now, it can be shown that the most probable or expected number of bacteria in a sample of n c.c.'s or ns particles is:

$$\epsilon(n\alpha)=nsp, \text{ or } \epsilon(\alpha)=sp \tag{III}$$

and further, that the *mean error* of this expected value

$$\epsilon(n\alpha)=\sqrt{nspq}, \text{ or } \epsilon(\alpha)=\sqrt{\frac{spq}{n}} \tag{IV}$$

The proof for these formulæ can be found in the more recent text-books on probabilities.

So far we have been theoretically correct in that we divided our sample into particles of the same size as bacteria. We might have used much larger droplets, distinguishing between those containing a bacterium and those not containing one. For the expression $\epsilon(\alpha)$ may be written

$$\epsilon(\alpha)=\sqrt{s\cdot\frac{\alpha}{ns}\cdot q}$$

wherein the s's cancel and q approaches unity as the size of particles decreases, for all reasonable number of bacteria (up to many million per cubic centimeter). So we may say, without appreciable error, that

$$\epsilon(\alpha)=\sqrt{\frac{\alpha}{n}} \tag{V}$$

This holds practically even when several dilutions are made. For supposing a plating after double dilution to .0001 yields 100 colonies. This means an error of

$$\sqrt{100} \text{ or } 10 \text{ per cent.}$$

The error of sampling the first dilution would be

$$\sqrt{100\times100} \text{ or } 100,$$

equivalent to 1 per cent and of sampling the original,

$$\sqrt{100\times100\times100}=1000$$

or 0.1 per cent. This would give a total mean error of sampling, including that due to dilutions of

$$\pm\sqrt{101}=\pm10.05 \quad\text{or}\quad \pm\sqrt{99}=\pm9.95$$

In considering a series of determinations, the same reasoning applies. If N samples of n cubic centimeters each are taken, the most probable or expected number of bacteria per cubic centimeter is

$\epsilon(Nna) = Nnsp$, or $\epsilon(a) = sp$ as before.

Similarly the expected error in the average of N determinations is

$$\epsilon(a_M) = \sqrt{\frac{a}{Nn}} \qquad \text{VI}$$

From these formulæ the following rules may be formulated:

The expected error in bacteria per cubic centimeter based on a single sample is equal to the square root of the quotient obtained in dividing the number of bacteria per cubic centimeter by the size of the sample taken in cubic centimeters.

The expected error of the mean of N samples is obtained by dividing the expected error for a single sample by the square root of N.

The mean value of N determinations is equal to the expected value for a single sample.

We are interested in knowing the probability that the bacterial count on any plate will not deviate from the true value by more than a certain number of times the mean error. The criterion of Tchebycheff tells us that the probability P_T of a deviation of a variable from its expected value, not larger than λ times its mean error, is greater than $\left(1-\frac{1}{\lambda^2}\right)$.

$$\lambda=3,\ P_T > 1-\tfrac{1}{9}=0.888$$
$$\lambda=4,\ P_T > 1-\tfrac{1}{16}=0.937$$
$$\lambda=5,\ P_T > 1-\tfrac{1}{25}=0.960$$

We are now in a position to plot the mathematical error of plating a sample of water or sewage, as well as the errors which may be expected once in five, ten times, etc. This has been done in Figure 1. These values are subject to the restrictions enumerated at the beginning of this section.

Two conclusions can be drawn from this mathematical study and by inspection of Figure 1:

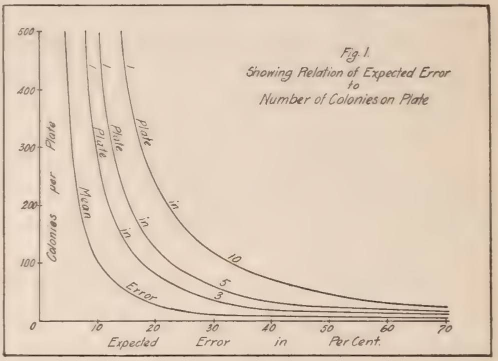

Fig. 1.
Showing Relation of Expected Error to Number of Colonies on Plate

1. The size of sample or the dilution should be such as to give from 200 to 400 colonies on the plate. With larger numbers the error decreases but slowly (and the greater accuracy is more than offset by interferences, etc.); while with smaller numbers the error increases rapidly.

2. There is considerable probability that, if only one plate is used, the count will depart largely from the true value. Hence the importance of making several plates (3 to 10) from the same sample, particularly in the case of disinfection and similar studies.

MATHEMATICAL INTERPRETATION OF RESULTS.

In actual work we do not know *a priori* the number of bacteria in the liquor under investigation, but attempt to deduce this from the tests. The vagaries of a single test have been shown in the preceding section. In laboratory tests, where we are following the same sample of sewage through various processes, a series of platings should be made at each desired step in the process. In plant control or large scale studies, it is obvious that the average of say thirty daily tests would depart much more from the true mean than would the average of thirty tests on the same sample. Let us restrict ourselves for the present to the laboratory condition.

Suppose we have made N platings of a sample. It can be proven that the *arithmetic mean* is equal (theoretically) to the expected number of bacteria, $\epsilon(a)=sp$ (Equation III).

Another important function is the dispersion. This may be indicated by δ and defined by the equation

$$\delta^2=\frac{(a_1-M)^2+(a_2-M)^2+\ .\ .\ .\ (a_N-M)^2}{N} \qquad \text{VII}$$

where a_1, a_2, a_3 . . . a_N are the number of bacteria obtained on the various plates, and M is the mean value. Now, it can be shown that δ is equal to ϵ or the mean error in a single trial. Thus we are able to approximate the number of bacteria in a sample from the average of a number of platings and the deviation of same.

A STUDY OF SOME ACTUAL RESULTS.

Below are given a few actual results to illustrate the methods of computation and the actual variations in results from the same sample of sewage due to errors of sampling, manipulation, etc.

Table I gives the results of a series of tests made by an experienced man with special care as to all details. This shows a standard deviation (dispersion) of 11 per cent or over twice the theoretical error due to sampling. Had only one test been made, and had this by chance been No. 14, the result would have been 25 per cent too high, whereas had the chance fallen on No. 4, the result would have been only 20 per cent of the correct value, and no one the wiser.

Table II gives the results of a series of tests made during routine work and shows a standard deviation of 26 per cent and maximum variations of over 40 per cent.

Table III is added as tending to show that the number of dilutions does not affect accuracy of results greatly.

From a considerable number of such series of tests we may roughly formulate the following as the variations to be expected, not regarding occasional "flukes."

1. For careful and accurate work (200 colonies per plate):

a. Standard Deviation	±12%
b. Deviation (1 in 10 times)	±25%

2. For ordinary routine work (200 colonies per plate):

a. Standard Deviation	±25%
b. Deviation (1 in 10 times)	±50%

Now, as to tests made in the routine of plant operation and control. Obviously, in addition to the errors due to sampling and plating, as in a single sample, we here have variations in the samples themselves, which make it much more difficult to interpret results rationally.

In water supplies the variation may be periodic from season to season, as in lakes and large reservoirs, or this periodic fluctuation may have superimposed upon it very erratic changes, as those due to floods, etc., in river supplies.

In the case of sewage there are several superimposed periodic variations: a daily, a weekly and a seasonal period, and in addition a secular fluctuation due to gradually changing conditions.

The condition in which the proportion of positive to total results (that is, the probability) varies from test to test has been studied mathematically, and the series of errors thus derived is known as the Lexian or hypernormal series. It can be shown that the mean in such a series is the same, as in the usual (Bernoullian) series already discussed, but

TABLE I.

RAW SEWAGE, WEST 58TH STREET OUTFALL, JULY 2, 1918.

Incubation, 24 hrs. at 37° C. Dilution, 1/100×1/100. Controls, 0-0-0. Special Care Used.

	Count.	Deviation.	Deviation.^{2}
1	3,780,000	204,000	41,600,000,000
2	4,340,000	356,000	126,600,000,000
3	3,800,000	184,000	33,900,000,000
4	840,000 (omitted)		
5	4,280,000	296,000	87,600,000,000
6	3,340,000	644,000	414,000,000,000
7	3,980,000	4,000	16,000,000,000
8	3,300,000	684,000	466,000,000,000
9	4,370,000	386,000	149,000,000,000
10	4,160,000	176,000	31,000,000,000
11	4,060,000	76,000	5,760,000,000
12	3,730,000	254,000	64,500,000,000
13	3,650,000	334,000	111,200,000,000
14	5,000,000	1,016,000	1,030,000,000,000
15	Overgrowths		
			2,577,160,000,000
Av.	3,984,000		
Med.	3 980,000		

Standard Deviation $\sqrt{\frac{2,577,160,000,000}{13}} = \pm$ 445,000 = ±11.2%

Maximum Deviation = +1,016,000 = +25.5%

= − 684,000 = −17,1%

Computed Mean Error $\sqrt{\frac{3,984,000}{1/10000}} = \pm$ 200,000 = ± 5.0%

Lexian Ratio = 2.2

Coefficient of Disturbancy = 10.0

TABLE II.

RAW SEWAGE, WEST 58TH STREET OUTFALL, MAY 31, 1918.

Incubation, 24 hrs. at 37° C. Dilution, 1/100×1/100. Controls 0-0-0. Routine Analysis.

	Count.	Deviation.	Deviation.^{2}
2a	1,800,000	20,000	400,000,000
b	2,410,000	630,000	396,900,000,000
3a	1,320,000	460,000	211,600,000,000
b	1,130,000	650,000	422,500,000,000
4a	1,050,000	730,000	532,900,000,000
b	2,040,000	260,000	67,600,000,000
5a	1,810,000	30,000	900,000,000
b	2,020,000	240,000	57,600.000,000
6	2,500,000	720,000	518,400,000,000
7	1,720,000	60,000	3,600,000,000
Av.	1,780,000		2,212,400,000,000
Med.	1,805,000		

Standard Deviation $\sqrt{\frac{2,212,400,000,000}{10}} =$ +470,000 = ±26.4%

Maximum Deviation = +720,000 = +40.0%

= −730,000 = −41.0%

Computed Mean Error $\sqrt{\frac{1,780,000}{1/10000}} = \pm$133,000 = ± 7.5%

Lexian Ratio = 4.2

Coefficient of Disturbancy = 30.7

TABLE III.

Raw Sewage Diluted to 1/100, West 58th Street Outfall, June 5, 1918.

Incubation, 24 hrs. at 37° C. Dilution, 1/100. Controls, 0-0-0.

	Count.	Deviation.	Deviation.^{2}
1	24,000	18,560	344,100,000
2	36,500	6,060	36,700,000
3	40,800	1,760	3,100,000
4	42,200	360	129,600
5	26,100	16,460	271,000,000
6	30,000	12,560	158,000,000
7	62,000	19,440	378,000,000
8	43,500	940	884,000
9	58,500	5,940	35,200,000
10	62,000	19,440	378,000,000
Av.	42,560		1,605,113,600
Med.	41,500		

Standard Deviation $\sqrt{\frac{1,605,113,600}{1\ 0}}$ $=\pm 12,670=\pm 29.8\%$

Maximum Deviation $=+19,440=+45.7\%$

$=-18,560=-43.5\%$

Computed Error $\sqrt{\frac{42,560}{1/100}}=\pm\ 2060=\pm\ 4.8\%$

Lexian Ratio $=6.15$

Coefficient of Disturbancy $=29.3$

the dispersion is greater. There can be many such series, depending upon how the probability varies from test to test. An extreme and very interesting case is that in which the probability varies from zero to one (*i.e.*, certainty) during the series of tests. Such a series can be readily studied both mathematically and experimentally by the black and white ball scheme, and may be regarded as a sort of standard for inconsistent results. (See No. 15, Hypernormal Mathematical Series (Lexis) in Table VI.)

Most statistical series are in the Lexian group so that the dispersion obtained is that of a Lexian series rather than of a normal or Bernoullian series. We have two criteria by which to judge the departure of the series from normal conditions:

a. *The Lexian Ratio:* which is the ratio of the dispersion computed from the actual tests to the theoretical mean error ϵ or δ_B (for a series of tests):

$$L=\frac{\delta}{\delta_B} \qquad \text{VIII}$$

b. *The Charlier Coefficient of Disturbancy:* which has the advantage of eliminating the effect of the number and size of samples:

$$100p=\frac{\sqrt{\delta^2-\delta_B{}^2}}{M}\times 100 \qquad \text{IX}$$

In Table VI the Lexian Ratio and Coefficient of Disturbancy are given for a number of statistical series and error series for bacterial tests. Values for a subnormal, normal and hypernormal mathematical series are inserted to act as guide posts. It will be noted that the monthly data, based on one test a day, group around the Hypernormal Series, which we have characterized as a standard of inconsistency.

This state of affairs imposes upon the sanitary engineer, in addition to the precautions for the single test, the necessity of studying these various fluctuations, before any reliable judgment can be passed upon the bacterial content of the water or sewage in question.

In addition, it must be remembered that even when the sampling schedule covers the full scope of these variations, the deviations will be many times greater than in the same number of tests made on a liquor of constant composition.

It is not intended to create the impression that an extremely elaborate series of tests should usually be made, but rather that the usual tests should be supplemented sufficiently by careful study of conditions to enable a fair judgment of their true significance to be rendered, and it should be realized that monthly averages as usually made are very far from being representative.

Relation of Usual Count to Total Bacteria.

The bacterial count does not represent the total number of bacteria present, even if all errors of sampling and manipulation are eliminated.

Examination of samples of sewage under the high power microscope will reveal many particles to which numerous bacteria are clinging, and there is good evidence that many more are occluded within the particles. The writer has attempted to separate or release such bacteria previous to plating by vigorously shaking the sample for ten minutes in a sterile bottle containing coarse sterilized sand. A record of a number of such tests is shown in Table IV, which shows an increase of 67 per cent over the usual method. In Figure 2 are given the results of an experiment on the effect of various periods of shaking.

But, even so, there is no record of the types which do not find the media and conditions favorable to development—such as anærobes. In investigating this question the writer made use of a method, the application of which to sewage work he believes to be novel, *i.e.*, the direct count. The sample, after vigorous shaking with sand as above outlined, is stained with methylene blue. A drop is then placed on a blood-counting cell and counted under the high power microscope. (This method shows some promise as a means for rapidly determining the bacteria in sewage, aside from its usefulness in this case.) In one instance, where the average of ten tests by the usual method gave 3,950,000 per cc., the direct count gave 70,720,000 as the average of ten counts made by two observers. This latter figure included dead cells and probably some minute organic particles which might have been mistaken for bacteria, but the difference seems too great to explain away on any such grounds. Since making the above tests the writer's attention has been called to the fact that recently work along similar lines has been done on soil analysis, giving about twenty times as many bacteria by direct count as by the plating method.

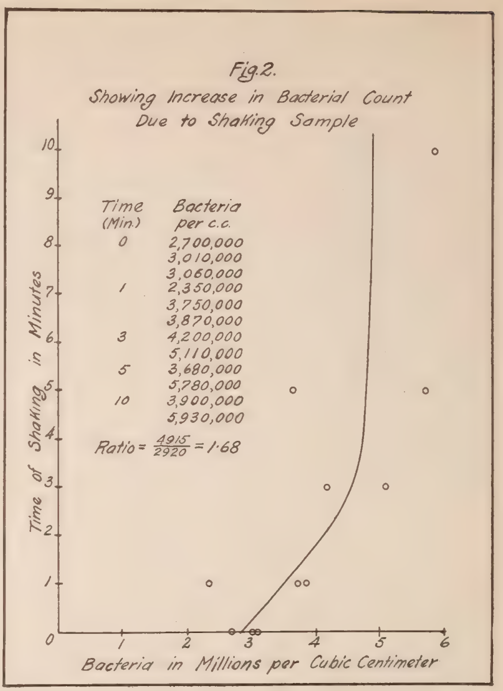

Fig. 2.
Showing Increase in Bacterial Count Due to Shaking Sample

Time (Min.)	Bacteria per c.c.
0	2,700,000
	3,010,000
	3,060,000
1	2,350,000
	3,750,000
	3,870,000
3	4,200,000
	5,110,000
5	3,680,000
	5,780,000
10	3,900,000
	5,930,000

Ratio = $\frac{4915}{2920} = 1{\cdot}68$

APPLYING THE STANDARD METHOD TO SPECIAL CONDITIONS.

In applying the standard count to unusual conditions considerable caution should be used if it is desired to avoid erroneous interpretation of results. As an example, the usual method of interpreting disinfection tests suggests itself. A raw sample and a disinfected sample are plated and incubated at 37° C. for 24 hours. The raw count is 2,000,000, the disinfected count, 20,000. The plates are returned to the incubator and counted again at the end of 48 and 72 hours. The raw will remain approximately constant, but the disinfected sample may give counts of 60,000 and 100,000 respectively. Apparently some of the bacteria were merely stunned or weakened by the disinfectant and only recovered sufficiently to develop as visible colonies one or two days later. Table V gives some actual results of this kind. This is quite apart from the question of "after-growths" which are due to multiplication of the bacteria, which have not been destroyed, in the water itself. Other cases where the literal use of standard methods will not yield the desired results will suggest themselves to the reader.

CONCLUSIONS.

It has been shown, that for platings of a uniform sample:

a. The expected error in a series of bacterial counts is given by the formula:

$$\epsilon(\alpha_M) = \sqrt{\frac{a}{Nn}}$$

b. That consistent with convenience, from 200 to 400 colonies per plate give the greatest accuracy.

c. That for ordinary work three, and for accurate work, five or ten platings should be made of each sample, a single plating being unreliable.

d. A study of Table VI shows that with sufficient care the error in determining the bacteria in a single sample can be made to approach the normal error of sampling, putting such determinations in a class with other reliable statistical data.

Further study of Table VI shows that the results of a series of bacterial samples taken from day to day are extremely inconsistent. The criteria show this inconsistency to be due both to errors in the single sample, which can be eliminated to a large extent, and to the fact that the samples were not properly apportioned to the variations in the water or sewage, which source of error can be reduced by study of these variations. In these days of standards for filterable water, drinking water, etc., would it not be well to inquire into the nature of the rule which we are using for our measurements, both to determine its actual length and establish its accuracy?

It has further been shown that usual methods do not give the total number of bacteria present, due to clotting and unsuitable conditions for their growth. Rather perfunctory tests indicate that the number developed by plating is not over 10 per cent of those present, but a review of governing conditions will convince that no constant proportion can exist.

It has also been shown that under unusual conditions the standard method gives distorted results, and that for special work modifications to reduce these distortions seem advisable.

TABLE IV.

Relation of the Bacterial Counts by the Usual Methods and After Shaking Samples for Ten Minutes.

Test.	Usual Method.	After Shaking Ten Minutes.
25a	2,170,000	2,640,000
b		3,970,000
c	1,360,000	2,700,000
26a	1,980,000	3,200,000
b	2,180,000	3,050,000
c	4,370,000	1,130,000
27a	2,980,000	2,770,000
b	2,060,000	3,640,000
c	1,450,000	3,310,000
28a	2,110,000	4,820,000
b	1,890,000	5,200,000
c	1,330,000	5,700,000
29a	3,280,000	4,110,000
b	2,500,000	3,920,000
c	2,000,000	2,180,000
31a	3,310,000	8,070,000
b	2,970,000	6,490,000
c	4,370,000	7,860,000
Av.	2,490,000	4,153,000

$$\text{Ratio} = \frac{4,153,000}{2,490,000} = 1.67$$

Above tests made on crude sewage at West 58th Street, Cleveland, Ohio, July, 1918.

TABLE V.

Bacteriology of Sewage. The Effect of Length of Incubation on Raw and Sterilized Sewage Counts.

		Raw Sewage.			*Sterilized.*	
	1st Day.	2d Day.	3d Day.	1st Day.	2d Day.	3d Day.
	No. 25					
A.	2,250,000	2,080,000	2,300,000	60,000	90,000	150,000
	2,140,000	1,850,000	2,010,000	40,000	40,000	50,000
	3,900,000	3,900,000	4,000,000	20,000	30,000	50,000
	2,763,000	2,610,000	2,770,000	40,000	53,300	83,300
	No. 26					
B.	1,980,000	2,270,000		60,000	60,000	
	2,180,000	2,980,000		80,000	200,000	
	4,370,000	5,570,000		80,000	150,000	
	2,840,000	3,610,000		73,000	137,000	
	No. 27					
C.	2,980,000	3,480,000	4,300,000	200,000	330,000	00,000
	2,060,000	2,410,000	2,920,000	90,000	300,000	310,000
	1,450,000	1,730,000	2,020,000	80,000	240,000	290,000
	2,163,000	2,540,000	3,080,000	123,000	290,000	300,000
	1,360,000	1,900,000	1,900,000	0	0	0
	2,170,000	4,010,000	3 620,000	0	0	0
				0	10,000	30,000
	1,765,000	2,960,000	2,760,000	0	3,300	10,000
			Averages of A, B and C.			
	2,763,000	2,610,000	2,770,000	40,000	53,000	83,300
	2,840,000	3,610,000		73,000	137,000	
	2,163,000	2,540,000	3,080,000	123,000	290,000	300,000
	2,589,000	2,920,000	2,925,000	78,700	160,000	191,000
	1	1.13	1.13	1	2.04	2.43

TABLE VI.

COMPARISON OF THE CHARACTERISTICS OF ERROR SERIES IN BACTERIOLOGICAL TESTS WITH THOSE OF COMMON STATISTICS AND MATHEMATICAL SERIES.

Description.	Lexian Ratio.	Disturbancy Coefficient.
1. Subnormal mathematical series (Poisson)	.98	$\sqrt{-1}$
2. Selected mortality series (life insurance)	1.00	0.0
3. Normal mathematical series (Bernoulli)	1.00	0.0
4. Birth series (a)	15.50	4.07
5. Birth series (b)	12.50	4.50
6. Fortunate series of ten plates on crude sewage	1.45	4.60
7. Marriage series	4.40	5.70
8. Careful series of fourteen plates on crude sewage	2.22	10.00
9. Ordinary series of ten plates on crude sewage	3.26	15.50
10. Ordinary series of ten plates on crude sewage	3.53	25.00
11. Ordinary series of ten plates on disinfected sewage	6.15	29.00
12. Daily tests for one month on crude sewage	5.30	41.00
13. Daily tests for one month on crude sewage	8.27	47.60
14. Daily tests for one month on crude sewage	9.00	49.00
15. Hypernormal mathematical series (Lexis)	7.40	50.80
16. Daily tests for one month on Lake Erie water	29.00	124.00
17. Daily tests for one month on filtered water	10.85	178.00

NOMENCLATURE AND FORMULÆ.

a = Number of bacteria per cubic centimeter.

β = Number of arbitrarily small particles of water per cubic centimeter.

s = Total number of particles per cubic centimeter, $s = a + \beta$.

p = Probability of drawing one bacterium, $p = \frac{a}{s}$.

q = Probability of not drawing one bacterium, $q = 1 - p$.

n = Number of cubic centimeters in each sample tested.

e = Expected Value—$e(a)$ = expected value of a, etc.

ϵ = Expected Error—$\epsilon(a)$ = expected error of a, etc.

N = Number of determinations.

λ = Size of error in terms of ϵ.

M = Mean value.

$a_1\ a_2\ a_3$ etc. = Number of bacteria per cubic centimeter in the individual samples of a series.

δ = Standard deviation.

L = Lexion ratio.

ρ = Charlier coefficient of disturbancy.

$e(a_M) = sp = a$.

$$\epsilon(a) = \sqrt{\frac{a}{n}} \text{ for a single test.}$$

$$= \sqrt{\frac{a}{Nn}} \text{ for } N \text{ tests.}$$

$$M(a) = \frac{a_1 + a_2 + a_3 \ldots . a_n}{N}.$$

$$\delta^2 = \frac{(a_1 - M)^2 + (a_2 - M)^2 + \ldots . (a_N - M)^2}{N}.$$

$$L = \frac{\delta}{\epsilon}.$$

$$100\rho = \sqrt{\frac{\delta^2 - \epsilon^2}{M}} \times 100.$$

◆

Annual Meeting, A. P. H. A., Chicago, Ill., December 9-12
Headquarters, Hotel Morrison
Plan Now to Go

THE NATION'S NEED OF PHYSICAL EDUCATION.

Willard S. Small,
Specialist in School Hygiene, U. S. Bureau of Education.

Address, American Public Health Association, Chicago, December 9-12, 1918.

Evidence of Need.

1. Thirty-five per cent of the men in the first draft were rejected as physically unfit. Allowing for under-height and special sensory defects, neither of which argues general physical unfitness, not less than 25 per cent were rejected for real physical unfitness. That means 2,500,000, between the ages of 21 and 30, were unfit for military service; therefore unfit to render full measure of service in any capacity; therefore unable to get full returns from life in work and happiness. An equal number of women doubtless suffer from disqualifying defects.

2. Passing of the physical examination is no guarantee of fitness for immediate intensive military training. Only a minority of the men when they arrive at camp have the strength, endurance, agility, muscular control and versatility, and disciplined initiative necessary for the rigors of immediate intensive military training. This minority is made up largely of men who have had thorough and varied athletic experience under competent direction. The majority is lacking in one or more of the requisites. Much time is lost in purely physical training and conditioning.

3. Very few of these men know how to take care of themselves. In reply to an inquiry upon this point, one camp officer replied, with humorous exaggeration, that a few of his men were acquainted with the toothbrush. Nearly all the men are physically uneducated; many of them are physical illiterates. And yet in the words of another able camp officer, "The percentage of men, under my command, who return home safe and sound will depend more upon knowledge of how to take care of themselves than upon any other one factor."

4. Approximately 1,000,000 young men each year reach military age. If the war lasts, each year we shall be handicapped by a like percentage of rejections and of physically unconditioned men, unless effective Federal legislation is enacted.

5. There are about 25,000,000 boys and girls of school age, 6 to 18 years, marching along the great highway of youth. Numerous investigations show that at least 50 per cent of these have defects and ailments that impede normal development in greater or less degree; that they live, at home and at school, in conditions more or less unhygienic; that they lack the positive physical education —play, athletics, gymastics, work—necessary to realize their potential man and woman power.

6. One state returns 85.87 per cent of its drafted men as physically unfit; another state, only 53.33 per cent—a variation of 32.54 per cent. Between Pennsylvania and New York the variation is 16 per cent. Federal legislation would not entirely eliminate these disparities. Differences of race, social heredity and industrial and economic character are involved. It would tend to equalize such disparities and it would positively improve conditions in all states.

7. Economic disparities between states are very great. According to the best available statistics, California, for each child between 5 and 18 years of age, has property to the value of $15,000; Mississippi, $2,100. For each 100 children, Nevada has 180 men of 21 years and over; South Carolina has 58. Such disparities can be equalized only by Federal aid.

CHARACTER OF LEGISLATION NEEDED.

1. It should interpret physical education in a broad and true way, as understood by the most competent experts in school administration and in physical education. It must assume physical activity as the basic thing, but conditioned upon and integrally related with wholesome physical environment, individual physical examination and record, medical supervision of schools and school children, development of health habits and instruction in health knowledge, hygienic school management and procedure, and coöperation with all agencies that make for physical upbuilding and the moral growth inevitably incident to sane, wholesome, active physical life.

2. It must provide for boys and girls alike. From the point of view of racial strength and integrity, physical upbuilding of women is of equal importance with that of men—perhaps of greater importance.

3. It should provide for all children and youth between 6 and 18 years of age inclusive. It should extend its benefits to youth above the compulsory school age by recognition of agencies already organized for doing such work, in the whole or in part; and by extension of the continuation school principle to include and secure a program of physical education for children in industry between 14 and 18 years of age.

4. It should provide for Federal aid to enable the states to erect and carry on thorough and effective systems of physical education. This Federal aid should be limited to preparation of teachers for skilled service and payment for skilled service.

5. It should provide for studies, investigations and demonstrations for the purpose of developing progressively scientific standards in the field of physical education as interpreted.

6. It should provide for administration of the law through the established Federal and State Educational agencies; and for the coöperation of the Federal Public Health Service with the Federal Bureau of Education in the administration of those phases of the law in which the scientific resources of the Public Health Service are necessary. It must guard against duplication of effort and conflict of interest.

7. It must guarantee the autonomy and initiative of the states. It must be so framed as to permit latitude of administrative procedure according to the genius and traditions of the several states and to encourage initiative and flexibility in the development of educational methods and processes. For example the relation of education authorities and health activities within the states, in regard to administration of health supervision, should not be prescribed. The relation established between the Federal Bureaus of Education and of Health might influence the states, but it would be unwarranted interference with state prerogatives to prescribe such a relation.

8. It should place primary emphasis upon the creation and development of a plan and means for the preparation of teachers for this important educational work. No money should be expended for the payment of service until satisfactory plans have been made for the preparation of teachers.

9. It should provide safeguards for the proper and effective expenditure of the Federal appropriations, both in the use of funds for public purposes and of provisions by the states of adequate supplementary funds and equipment.

RELATION TO MILITARY TRAINING.

1. The program proposed is not a substitute for military training; with respect to boys, it is pre-military training. It is

a program for producing physically fit boys and girls during the period of immaturity. The program stops at eighteen years of age. Efficient military training should begin not earlier than eighteen years. If universal military training should be adopted, this program would insure maximum preparation of a maximum number of young men for military training.

2. It is not exclusively preparatory to military training. It is for both sexes. It is for the strong and the weak. It is for efficient living, not merely for one function of life.

3. It would prepare for military training in the following ways:

(1) By selection of boys for military training:

a. Through recurrent physical examination during the growth period.

b. Through early detection and correction of remediable defects.

(2) By graded training:

a. A graded program of exercises, scientifically selected and administered, for all children of school age.

b. Corrective gymnastics for special postural and muscular defects.

c. Intensive physical training for the older boys who are potentially fit for military service. Athletics is the most effective instrument. The commander of one of the army training camps writes: "I have observed that athletes assimilate discipline quicker than any other class of men."

(3) By training in health habits, instruction in health knowledge, development of health ideals leading to a physical conscience.

(4) By increasing the physical efficiency of those fit for limited service only.

a. By early detection of defects.

b. By specialized training of such individuals.

c. By keeping them out of inappropriate occupations.

WHAT WILL IT DO FOR THE NATION?

What such a program, wisely administered, will do for military efficiency, it will do equally for efficiency in all civil functions. It will do for girls what it will do for boys. It will raise the positive coefficient of the physical life of the nation. It will build morality upon the solid foundation of physical soundness and vitality. It will be a powerful influence in Americanization. The democracy of the playground admits of no hyphenism of language; and the morality of the athletic field, fair play and respect for the rules of the game is the very essence of Americanism.

It will not do the impossible. It will be only one of the social agencies in the immortal conflict between human progress and human retrogression. Good housing, adequate food, and sane regulation of juvenile labor are equally necessary. The enactment and operation of such a law as proposed for physical education will be a powerful stimulus and support to these other movements.

The poignant words of an editorial, "The Wasted Years," in the conservative *London Nation* (September 23, 1916) might well be our own confession and pledge of reparation:

"The war has brought home to most of us a sense of guilt and shame in regard to this dreadful waste of the vigor and the happiness of the race. . . No self-respecting nation can go back after this war to the state of things which makes the proper development of the body and mind the luxury of a small and privileged class. This reparation at least we will make to the thousands to whom their country has given nothing and from whom she has taken their all. It shall never again be said that it is not until they are needed for the terrible uses of war that any care is taken of the mass of the youth of the country."

THE SEWAGE DISPOSAL PROBLEM IN CHICAGO.

C. D. Hill,

Engineer, Board of Local Improvements, City of Chicago.

To be read before the Sanitary Engineering Section, American Public Health Association, December 9–12, 1918, at Chicago, Ill.

SEWAGE disposal in Chicago is by the dilution process. The raw sewage of Chicago and its environs is discharged either directly into the Main Channel of the Sanitary District of Chicago, or indirectly by means of Chicago River, its branches, or other adjuncts of the drainage system. None of the sewage from the territory extending from the northern limits of Cook County to the State Line of Indiana is discharged into Lake Michigan, with the exception of that from a portion of the city of Evanston, where intercepting sewers are now being constructed that will divert this sewage from the Lake to the North Shore Channel, and with the exception of sewage contaminated water from the Calumet River. The Sag Channel, which is nearing completion, and the Calumet Intercepting Sewer System, which is now under construction, will eliminate this source of contamination. There still remains a very serious source of contamination from the sewage from the municipalities of northern Indiana bordering on the shores of the Lake.

The intakes of the water supply of Chicago are so located that the water is usually quite pure, but because of possible contamination the water is sterilized by chlorine so that one may drink the water without danger.

The completion of the present projects would seem to provide a complete solution of the sewage disposal problem, but, because of the growth of the city and because of the changing conditions, we will find that new projects and new methods will be needed before the present works are fairly completed. This has happened several times in the past, and it will be of interest to review briefly the history of the development of our sewage disposal works.

The Chicago River extends for a distance of less than a mile from Lake Michigan to the junction of the North and South Branches. From this point the North Branch extends northerly and northwesterly, and the South Branch extends southerly and southwesterly. The surrounding territory is a low flat plain with high ground in the distant northwest and southwest. Between these high grounds a low plain extended westerly and southwesterly, and in times of flood the southwest branch of the river was formerly continuous, with a corresponding branch of the Desplaines River, so that in early days, in flood times, one might pass by boat from the Chicago River to the Desplaines River and thence down to the Illinois.

In the extreme southern part of the present city of Chicago is the Calumet River, which drains a considerable portion of northern Indiana as well as northeastern Illinois. This river lies in a low marshy plain and at times of flood has been connected with the waters of the Desplaines through the Sag.

The first named connection between the Chicago and Desplaines Rivers was made the location of the old Illinois-Michigan Canal, the construction of which was started prior to 1850 and which has been paralleled more recently by the main channel of the Sanitary District of Chicago. The second connection between the Calumet and Desplaines Rivers was made the location of the old Feeder

Canal which supplied water to the summit level of the Illinois-Michigan Canal, and is the location of the Sag Channel which is now being constructed to connect the Calumet River with the main channel of the Sanitary District.

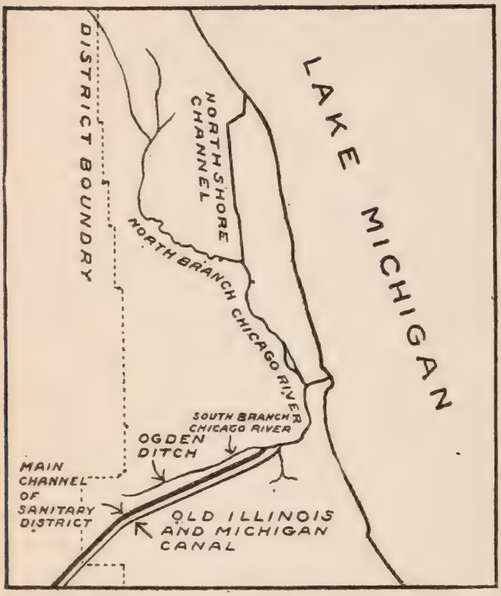
DISTRICT BOUNDARY
NORTH SHORE CHANNEL
LAKE MICHIGAN
NORTH BRANCH CHICAGO RIVER
SOUTH BRANCH CHICAGO RIVER
OGDEN DITCH
MAIN CHANNEL OF SANITARY DISTRICT
OLD ILLINOIS AND MICHIGAN CANAL

Fig. 1. Chicago River and Drainage Channels.

When the first sewers were built in the City of Chicago in 1855, the city extended approximately two miles north and two miles south of the Chicago River and approximately two miles west of the Lake. These first sewers all discharged into the river, or into the South Branch. Later, and prior to 1890, as the city grew, other sewers were built, all of which discharged into the river or its branches, with the exception of sewers in 12th Street, 22nd Street and 35th Street, which discharged into the Lake. During the latter years of this period, however, suburban villages north and south of the city, which have since been incorporated into the present city, constructed sewers discharging into the Lake, although so far as it was practicable all suburban villages discharged sewage into the river or its branches.

From the beginning of the construction of the sewerage system of Chicago it was understood that this method of disposal of the sewage would result in a foul condition of the river. Our first City Engineer, Mr. Cheseborough, considered various remedies for this condition. One was cutting a canal across the city from the Lake to the South Branch, approximately along the line of 16th Street, and another was the construction of a conduit along the line of Fullerton Avenue, from the Lake to the North Branch. This conduit was built in 1872. It was intended that water should be forced through these passages from the river to the Lake, thereby causing an inflow of water through the main river.

Mr. Cheseborough also considered discharging the water from the South Branch of the river into the Illinois-Michigan Canal, which had recently been completed. The summit level of the canal at its connection with the South Branch was five or six feet higher than the water level of the river. This plan was adopted and pumps were installed to discharge the water from the South Branch into the canal. By the time this project was put in operation the river had become so foul and the capacity of the pumps was so small that the dilution of the sewage was insufficient to produce any perceptible effect.

In 1865 an Act of Legislature authorized the city of Chicago to deepen the bed of the canal along the summit level so as to produce a steady flow by gravity from the river through the canal. This was supposed to solve the problem, but soon after the completion of this project it was found that the flow was insufficient. In 1881 an Act of Legislature provided for the construction of a large pumping station at the junction of the river and the canal. This station was erected and put in operation in 1886 and continued in operation until 1900. The pumps had a capacity of about 50,000 cubic feet per minute. The effect of the pumps was to prevent the flow of water from the Chicago River into the Lake, except in times of severe rains, and produced very slight dilution of the sewage in the river, the river being very foul at all times.

In 1885, the year before the pumps were put in operation, an unprecedented rain storm produced a flood which caused the Desplaines River to overflow into the South Branch. At the same time a large flood came down the North Branch and the combined floods flushed the Chicago River and both branches, carrying a vast amount of filth into the Lake. As a result of this condition a Water Supply and Drainage Commission was appointed to recommend the construction of such works as might be needed.

This Commission, headed by Rudoph Hering, recommended the construction of the Sanitary District Channel and its adjuncts substantially as it now exists. The recommendations of the Commission were incorporated in an Act of the Legislature in 1889. Work was started in 1890 and the main channel finished so that water passed through it in 1900. Since then the limits of the original district have been extended to the north to the limits of Cook County, and have been extended to the south several miles beyond the southern city limits.

As a result of the annexation of territory in 1889, the area of the city was increased from about forty square miles to nearly two hundred square miles. The development of the annexed territories north and south of the old city resulted in the construction of additional sewers emptying into the Lake and a largely increased flow through the sewers previously constructed.

The city of Chicago continued the policy of building sewers in the suburban districts discharging into the Lake, although at the same time the Sanitary District was spending money to divert all sewage from the Lake.

In 1896 the city of Chicago adopted the policy of constructing intercepting sewers along the shores of the Lake so as to divert all of the sewage from the Lake and discharge it into the Chicago River or its branches. This policy, however, was limited on the South Side to 87th Street, that being the southern limits of the Sanitary District at that time. South of 87th Street sewers were built and have continued to be built which discharge directly into the Calumet River.

After the extension of the limits of the Sanitary District the sewage from the municipalities north of the city was collected by means of an intercepting sewer and was brought down to the northern limits of the city of Evanston and there discharged into the North Shore Channel, which is a prolongation of the North Branch of the Chicago River. This channel has a connection with Lake Michigan at Wilmette through which water is pumped from the Lake into the channel thereby producing a flow which dilutes the water of the North Branch of the Chicago River. At the present time intercepting sewers are being built in the city of Evanston which will divert its sewage from the Lake to the North Shore Channel.

In the Calumet District work has been in progress for some years on the construction of the Sag Channel which will connect the Calumet River with the main channel of the Sanitary District. This channel is necessarily small in capacity, while the storm flow of the Calumet River at times is very great. This makes it necessary to divert all sewage from the Calumet River, and intercepting sewers are now being built which will accomplish this purpose, the sewers discharging into the Sag Channel just below the point of connection with the river.

The Act of the Legislature, which provided for the construction of the Sanitary District Channel, required 300,000 cubic feet of water per minute to pass through the channel for the purposes of dilution at the time the channel was first opened, and required 600,000 cubic feet per minute when the population of the district should increase to 3,000,000.

The channel as originally built through the rock section had sufficient capacity for this maximum flow, and through the earth section, while its original capacity was that of the minimum amount, it has since been widened so as to provide for the maximum flow. When the channel was first opened a permit was granted by the United States authorities for a flow of 250,000 cubic feet per minute through the Chicago River. This was supposed to be the maximum amount that could flow through the river at that time without interfering seriously with navigation. Since that time the river has been deepened and straightened and in some places widened so that with a maximum flow there would be little, if any, interference with navigation. The federal authorities, however, insist that the limits of the original permit still apply and that there is serious objection to permitting an increase because of the danger of lowering the level of the Lake. The fact that the level of the Lake today is considerably higher than it was in 1900 when the channel was first opened does not appear to affect the argument.

The experience of the past fifteen years indicates that the rate of dilution recommended by the Commission was barely sufficient to provide for the sewage from the population of the district. This rate, however, did not take into consideration the gross pollution from industries, and the actual condition of the water in the channel for the past few years has not been satisfactory, principally because of the vast amount of filth discharged into the channel from industries and particularly from the Stock Yards district. The pollution of the water that is discharged into the Desplaines River and Illinois River is sufficiently great to justify complaints from residents of the state living along the borders of the rivers; this is in despite of the fact that at times a larger flow is maintained than was contemplated under the terms of the original permit from the Federal authorities. There is serious danger that the Federal Government will not permit the increased flow that is needed and may indeed restrict the flow to an amount that would be entirely inadequate.

These conditions have led to numerous negotiations with Federal authorities and to the instigation and prosecution of litigation, but no results have been obtained either from the negotiations or from the litigation. At the same time the Sanitary District of Chicago has made continuous studies of the problem, particularly with respect to various methods of sewage purification that might be installed in case the Federal Government should not permit the necessary dilution. These studies were appropriate even though the Federal Government should permit the maximum flow through the channel, for the reason that the time is approaching when the population of the city will exceed that which was contemplated by the Commission which recommended the present works.

The Sanitary District has made a series of investigations as to the treatment of industrial waste and particularly the waste from the Stock Yards district. Definite conclusions have been reached as to the method of treating the waste from the Stock Yards district, and negotiations are pending as to allotment of the cost of establishing and operating such purification works.

The situation today is quite critical. The Federal Government may restrict the flow from the Lake so that it will be impossible to dilute the sewage to the extent required by the Act of 1889. Under this condition the state would be justified in objecting to the discharge of the grossly polluted water from the canal into the Desplaines River, and requiring the construction of supplementary works for treatment of the sewage. To build new treatment works that would purify the sewage sufficiently so that with the limited dilution of lake water the affluent would not constitute a nuisance, would require years and would cost so much that it would be necessary to obtain legislation.

There is a lack of appreciation on the part of the general public in Chicago of the seriousness of this situation. Few people realize the opposition of Federal officials to the operation of the channel in accordance with the original plan, and fewer realize the opposition to Chicago from the people of other cities along the Great Lakes. This opposition is due largely to a mistaken notion as to the effect of the flow of water through the channel upon the level of the lakes; nevertheless, it is real.

If we should be so fortunate as to obtain from the Federal Government permission to operate the channel at its full capacity, it will be difficult to make the people of this community understand that, because of the growth of population and the consequent increase of pollution of water, it will be necessary to install auxiliary purification works, and once more we will repeat history by showing by actual conditions the inadequacy of present methods long before new works can be installed.

One thing should be made plain and that is that there has been made no serious mistake in the successive steps through which the sewage disposal works of Chicago have evolved, except the mistake of procrastination. Each step has been logical and reasonable, and to have attempted other methods would probably have been unwise.

At the time the present works were planned there was strong argument on the part of a few progressive engineers that the construction of a large canal providing for dilution was unwise and extravagant, and that a much better plan would be to build sewage purification works. If such a plan had been followed, the method of purification adopted would probably have been obsolete before the work had been fairly started, and if Chicago could have changed its work as often as the engineering profession has changed its opinion as to the most effective method of sewage purification, the works would have undergone a continuous process of rebuilding.

It is quite possible that the best method of sewage treatment has not yet been developed. However, we are fast approaching the day when some method supplementing dilution must be adopted.

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DISSOLVED OXYGEN AS AN INDEX OF THE POLLUTION OF NEW YORK HARBOR.

KENNETH ALLEN,
Sanitary Engineer, Board of Estimate and Apportionment, New York City.

To be read before the Sanitary Engineering Section, American Public Health Association, December 9-12, 1918, at Chicago, Ill.

EVER since the appointment of the New York Harbor Pollution Commission in 1903, a systematic attempt has been made to keep track of the pollution of the harbor water. The Metropolitan Sewerage Commission, Dr. George A. Soper, President, recognized the value of dissolved oxygen determinations as a measure of the digestive capacity of the water and, inversely, of their pollution, and tests begun by the commission in 1909* have been continued by the Board of Estimate and Apportionment of the city, of which Nelson P. Lewis is Chief Engineer, to the present time.

The results of these tests are very significant and show a surprising and persistent decline in the degree of saturation in all parts of the harbor, especially in the Harlem and Lower East Rivers. As is recognized by sanitary engineers conversant with the situation, this is a matter of considerable importance to the welfare of this great seaport and especially to those living or owning property in the vicinity of its shores. The purpose of this paper is to show to what extent the pollution of the main parts of the harbor has progressed as made manifest by determinations of dissolved oxygen.

In all, 2,342 samples were analyzed by the Metropolitan Sewerage Commission and 1,859 by the Board of Estimate and Apportionment. In the interpretation of results a distinction must be made between the tests made in cold weather and those made in summer. Figure 2 shows in a very rough way about the way in which the saturation figures vary at different points and at different seasons. It is seen that while there is a progressive decrease in the warm weather saturations, the winter figures remain high throughout. Even as late as April this holds true, as will be seen by Table I.

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* A limited number of tests were made by the commission in 1906.

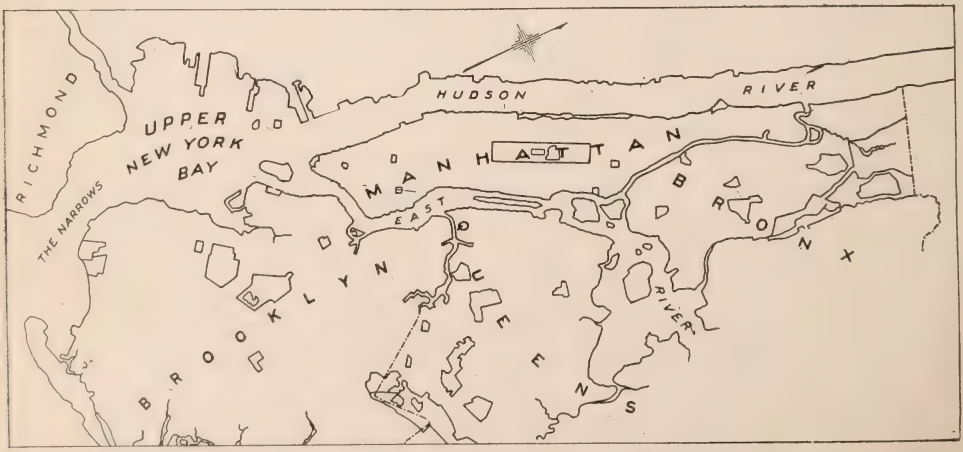

FIG. 1. Map of the Hudson River and New York Harbor.

TABLE I.

AVERAGE SATURATIONS OF DISSOLVED OXYGEN IN APRIL, 1918.

		Per. Cent.
Hudson River	Pier A	71.8
	42d St.	70.8
	155th St.	70.8
	Dyckman St.	72.0
	Spuyten Duyvil	73.3
Harlem River	Spuyten Duyvil	75.3
	Morris Heights	76.5
	151st St.	69.8
	Willis Ave.	79.0
	106th St.	75.0
East River	42d St.	76.0
	23d St.	79.3
	Pier 10	77.7
Upper Bay	Mouth of Gowanus	75.5
	Robbins Reef	76.5
	Bell Buoy 2G	62.0
	The Narrows	77.0
Kill van Kull	B. & O. Dock	68.0
	Shooters Island	65.5
Arthur Kill	B. & O. Bridge	64.5

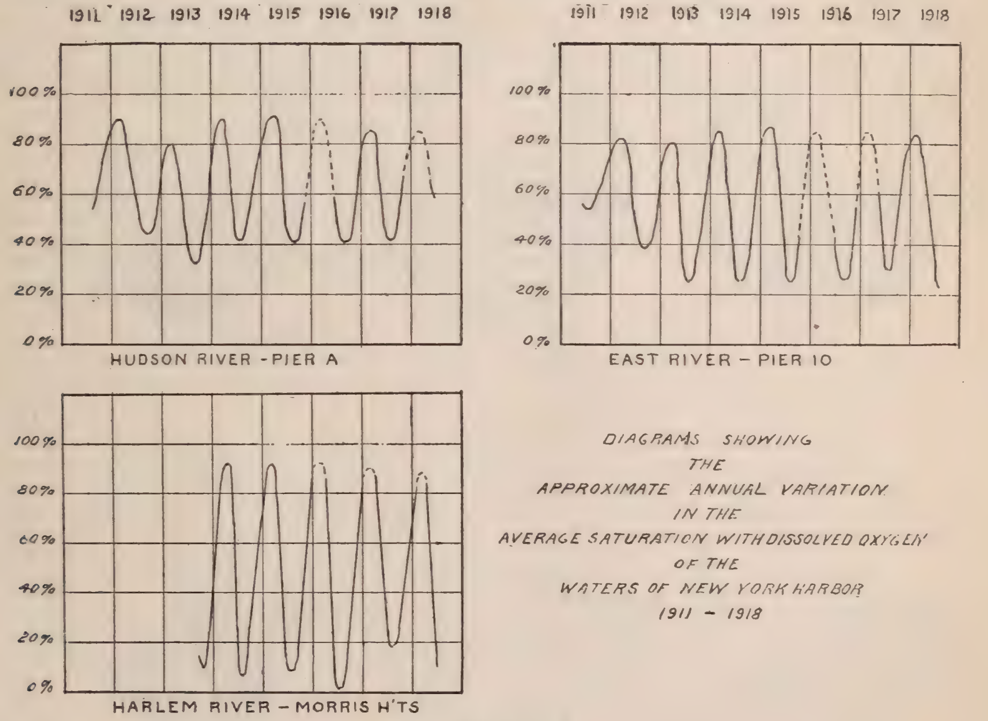

FIG. 2.

The lowest average percentage of saturation is seen to be 62, in the Upper Bay, while the others range up to 79 per cent—a condition of the water that in this regard may be called entirely satisfactory.

The general conclusion to be drawn from this is that *there is no danger of the development of putrefactive conditions with their attendant odors in any of the main bodies of water in New York Harbor during the cold months of the year.* And, as a corollary, it follows that for an indefinite time no steps to prevent such putrefactive conditions *during cold weather* will be necessary. In fact, the saturation figures are so high that even fish life, which in general may be said to require about 50 per cent dissolved oxygen, is not likely to be seriously affected.*

The significant determinations are therefore those made during the warm months, and for our purposes those confined to the months of June, July, August and September only have been compiled

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* While this is true of the main channels it does not apply to certain locally-polluted points. For instance, a complete depletion of dissolved oxygen was found near the head of Newtown Creek last winter when the surface was largely covered with ice.

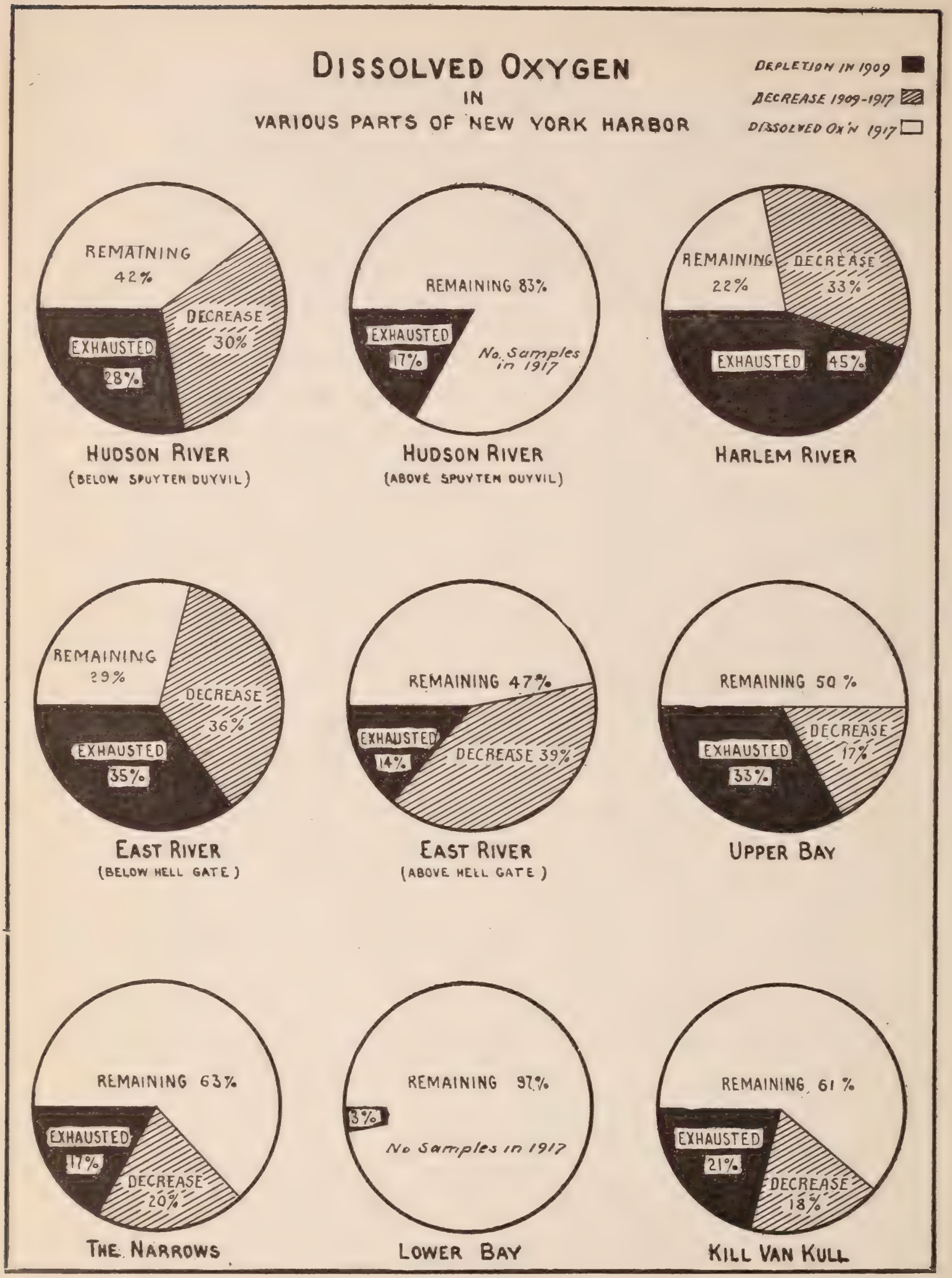

FIG. 3. Note: These diagrams are based on the analysis of 648 samples collected between June 1 and October 5, 1909, and 264 samples collected between June 1 and October 1, 1917.

(with a few exceptions prior to 1914 as noted) and the averages at certain points given in Table II and the diagrams in Figure 3.

TABLE II.

Average Saturation of Dissolved Oxygen in the Main Branches of New York Harbor.

	1909*	1911*	1913*	1914	1915	1916	1917
	%	%	%	%	%	%	%
The Narrows.....	83	76	69	68	78	63	63
Upper Bay—Robbins Reef......	67	72	66	71	72	64	50
Hudson River....	72	62	57	50	43	46	42
Harlem River.....	55	42	29	30	28	24	22
Upper East River	86	69	..	50	..	..	47
Lower East River.	65	54	43	40	33	26	29

The latter show graphically the general increase of pollution in the harbor. Stated roughly, we may say that *in the Harlem River and the East River there is but half as much dissolved oxygen in summer as there was in 1909, and in the rest of the harbor but about three-fourths as much as in that year.* The increase in population during this period directly tributary to the harbor (omitting New Jersey) during this period, which is the chief contributing factor in the depletion of oxygen, is shown in Table III.

TABLE III.

Estimated Population of New York City Directly Tributary to Certain Main Branches of the Harbor.

	1909	1917	Per Cent Increase
Upper Bay and Narrows	526,000	712,000	35
Hudson River—Lower.	711,000	855,000	20
Harlem River.........	620,000	833,000	34
Lower East River.....	2,107,000	2,709,000	28

Now, while odors may occur with the discharge of large volumes of septic sewage or by the generation of gas bubbles by fermentation of the underlying sludge, they are not *produced* in polluted water until the dissolved oxygen is entirely used up. The change is then rapid to the putrefactive stage with its repulsive odors. The importance of avoiding this condition is evident, and it follows that *minimum* saturations are of prime significance. These, for several points in the harbor, are given in Table IV and are shown graphically in Figure 4.

TABLE IV.

Minimum Degree of Saturation with Dissolved Oxygen Observed at Certain Stations in New York Harbor.

	1909	1911	1912	1913	1914	1915	1916	1917
	%	%	%	%	%	%	%	%
The Narrows...	65	62	61	43	45	54	48	46
Robbins Reef...	62	64	53	38	70	58	51	42
Hudson River:								
Pier A.......	57	49	51	25	31	25	29	25
155th St......	55	57	..	..	36	22	25	20
Spuyten Duyvil........	55	68	..	50	64	35	28	..
Harlem River:								
Morris Heights	..	46	..	..	6	8	0	1
Willis Avenue	54	29	..	..	0	6	1	0
Lower East River:								
23d St........	52	..	..	39	28	19	8	10
Pier 10.......	52	49	49	13	19	22	17	19

As the worst conditions naturally occur near sewer outlets and at other points near the shore where currents are retarded and where deposits of sludge have formed, we may infer from these figures that:

a. *The conditions in the Lower East River and the Harlem River are such that local nuisances from foul odors may be looked for at any time after several days of very hot weather.*

b. *The conditions in certain parts of the Hudson River and of the Upper East River are approaching those that already obtain in the Lower East River.*

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* A few of these samples were tested between October 1 and June 1.

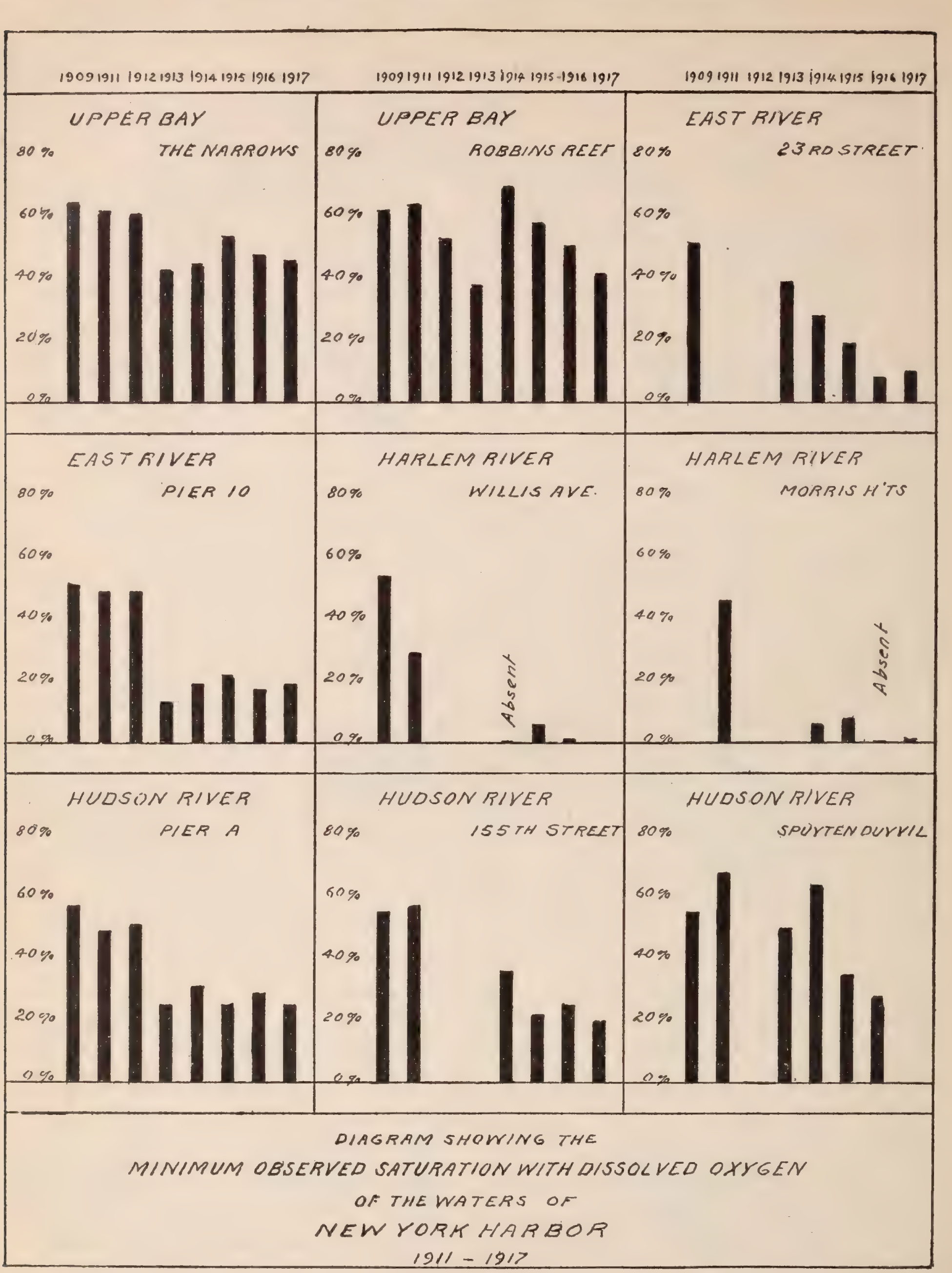

FIG. 4.

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In Less than Three Weeks:
Annual Meeting, A. P. H. A., Chicago, Ill., December 9-12
Be There!

VACCINATION AS A WAR MEASURE.

Maurice Ostheimer, M. D.,
Assistant Diagnostician, Bureau of Health, Philadelphia, Pa.

To be read before the Public Health Administration Section, American Public Health Association, December 9–12, 1918, at Chicago, Ill.

No one will dispute the fact that the health of our army and navy is paramount when the country is at war. But close behind this stands the health of the civil population. Smallpox has become prevalent throughout the United States since this war began. It is most important, therefore, not only that the vaccination laws existing in the several states be rigidly enforced, but also that new regulations must become necessary to cover circumstances which could not have been foreseen before the war. Just as one finds nowadays a few well-meaning though misguided individuals, who conscientiously object to fighting, so, too, there has existed a small but noisy band who object conscientiously to vaccination. That such persons have been able to influence some of the lawmakers of some of our states is most unfortunate. Our boys "over there" are fighting for all that is right; ought not we here fight at least to prevent smallpox?

The intention of this paper is not to open any controversy as to method or technique. Everyone will grant that it is essential to use fresh virus, well rubbed in, on a skin surgically clean. What seems most important is that vaccination regulations be carried out rigidly. In most states vaccination is compulsory only for the child of school age. Laws concerning the vaccination of adults either do not exist or apparently are not enforced.

The attention of many communities has recently been called to this condition by the migration of workers to points where large munition plants are located. While most of these men have been vaccinated, there remains a varying percentage who have never been successfully vacinated; and these are the men who spread smallpox. In Philadelphia only five cases of smallpox were reported in 1916; twelve cases in 1917; and up to the present, in 1918 there have been already 33 cases! Isolated cases of smallpox, reported here and there, when investigated, disclose identical facts. Someone has come to work either developing or convalescing from smallpox. One or more fellow workers, inmates of his household or simply contacts, in every instance unvaccinated persons, promptly developed smallpox. Since these men often remain but a short time in any place, one migrating worker has been known to infect one or more people in two or more localities within a week or ten days. Occurrences of this kind would seem to make necessary some Federal law regulating the vaccination of adults, especially of workers migrating from place to place.

It is true that the large industrial plants, employing a staff of physicians, have been requested, both by the United States Public Health Service and the Ohio State Department of Health, to take the precaution of vaccinating the unvaccinated worker at some time near his arrival. But more or less time elapses before each man is finally vaccinated; and there is always the chance that inert virus was used. For instance, during the summer a negro boy, who had been at Hog Island working in the shipyard for five weeks, developed smallpox. Investigation disclosed the fact that he had been vaccinated on arrival; but this vaccination had not been successful. Of course all of us know that vaccine will vary in its activity; but a good virus, kept on ice, will usually take. It is unfortunate that any industrial physician should consider his duty done just as soon as he has vaccinated each worker; whether the vaccination has been successful only comes into question in case that worker later develops smallpox.

The Federal government alone can effect some regulation to control the vaccination of laborers migrating from state to state. Would it not be practicable for the United States Public Health Service to request of the United States Railway Administration that tickets for places outside of one state be sold only to a purchaser who presents certificates of successful vaccination for each member of his party? Such certificates could be issued either by the municipal or county health officer, or by any private physician, provided such a regulation had attached to it the penalty of a fine or imprisonment or both, for the physician who should give a fraudulent certificate. One certificate would do for the man who was to make a straight trip through several states; but should he wish to stop off in more than one state, he would need several certificates, or he might procure new certificates each time he bought tickets out of a state. Facts might be hard to prove should an unvaccinated person, provided with a fraudulent certificate, carry smallpox into another state. It would, of course, be easy for a vaccinated individual to procure a certificate by giving to the examining physician the name of the unvaccinated person who later used the certificate and spread the disease. If a worker comes North with his family, certificates for each member of the family would have to be presented. In Philadelphia recently we found a large negro family, recent arrivals from the South, not one member of which family had ever been vaccinated. This explained the occurrence of seven cases of smallpox in one small house!

The presentation of such certificates might work some hardship and would undoubtedly cause some delay in departure at first; but publicity in the newspapers together with large placards at all railway stations would rapidly overcome this objection. Armed with vaccination certificates for the entire family, it would take but little longer to procure tickets to take the family away for the summer than it did previously, provided each member of the family had already been successfully vaccinated. Suggestions that all travellers be examined for successful vaccination scars by the physicians of the United States Public Health Service, either at railway stations or on trains are not practical, especially now when the war has taken away most of our medical men.

A word of caution might be uttered to those physicians on duty at the industrial plants, asking them not only to examine with care for vaccination scars, but to vaccinate all doubtful applicants and to keep these men under observation, having each one report one week later for reexamination, and for revaccination should the first attempt have failed. For the health of the munition worker is fully as important as is that of the fighting man! Carefulness of this kind should help reduce our outbreaks of smallpox.

Finally, then, I would beg to propose the following: That the chairman appoint a committee (of three or five) to draw up a resolution requesting the Surgeon-General of the United States Public Health Service to put into practice this or some other practical method, to secure the vaccination of all unvaccinated adults, and thus to eliminate smallpox from the United States.

THE 1890 EPIDEMIC OF INFLUENZA IN CHICAGO AND ITS INFLUENCE ON MORTALITY, 1890 TO 1893 INCLUSIVE.

W. A. Evans, M. D.
AND
M. O. Heckard, M. D.,
Chicago Department of Health.

ALTHOUGH the present epidemic of influenza began in Europe several months ago cablegrams informing us of the continued or recurring prevalence of the disease in England, France and Germany are received from day to day. This prompts an inquiry into the history of past epidemics of this disease with a view to determining what we may expect in the next few years.

Hirsch's "Handbook of Historical and Geographical Pathology" records almost one hundred epidemics occurring in the eight hundred years prior to 1889. It is clearly set forth that practically each of these epidemics lasted longer than one year or else recurred several times during the course of two or more years. Consideration of this fact led us to study the record of the pandemic of 1889–93 as it exhibited itself in Chicago. The material for the study was found in the yearly reports of the Chicago Health Department for the years 1888 to 1894 inclusive.

In 1890 Dr. S. Wickersham, health commissioner, said in his annual report:

"Influenza beginning in our city early in January reached its height the last week in January at which time my belief is that over 100,000 of our citizens were sufferers from that cause alone. It continued to prevail during February, March and April in a modified degree. Its duration was about four months. In the week having the highest mortality there were 694 deaths."

In 1891 the disease recurred for we find Dr. J. D. Ware, then health commissioner, saying in his annual report, "During March and April there were 3,400 deaths in each month largely due to pneumonia and influenza which seemed to be epidemic."

No mention is made of influenza in the annual reports of 1892–93, but Dr. A. R. Reynolds, health commissioner at that time, tells us that the disease prevailed as late as 1893.

The influenza bacillus was not discovered until the epidemic was well under way and as a means of general diagnosis bacteriologic examinations were not employed. Diagnosis was by clinical symptoms. In view of the well-known influence of publicity on diagnosis our judgment is that the best basis for judgment as to the effect of influenza in 1889 to 1893 is the curve for deaths from all causes.

Diagram 1 shows the monthly distribution of deaths from all causes in 1889.

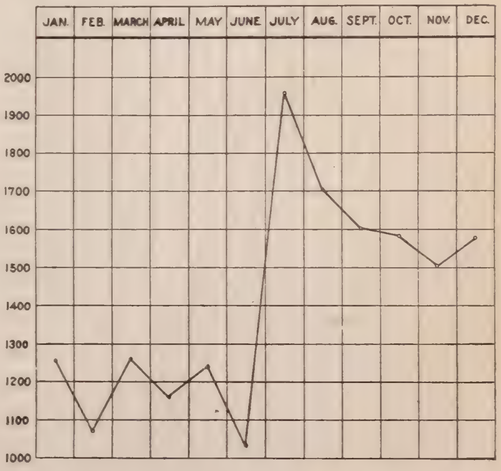

Diagram No. 1—Deaths from all causes in 1889. Chicago.

Between 1889 and 1893 the population of Chicago increased 5.2 per cent a year.

This diagram is shown for two reasons. In the first place it indicates the distribution of deaths throughout the year under normal conditions in the year just prior to the onset of the epidemic. In the second place we use the deaths per months in 1889 as a basis for the chart showing the great increase in mortality during the late Winter and the Spring. During this period the population of

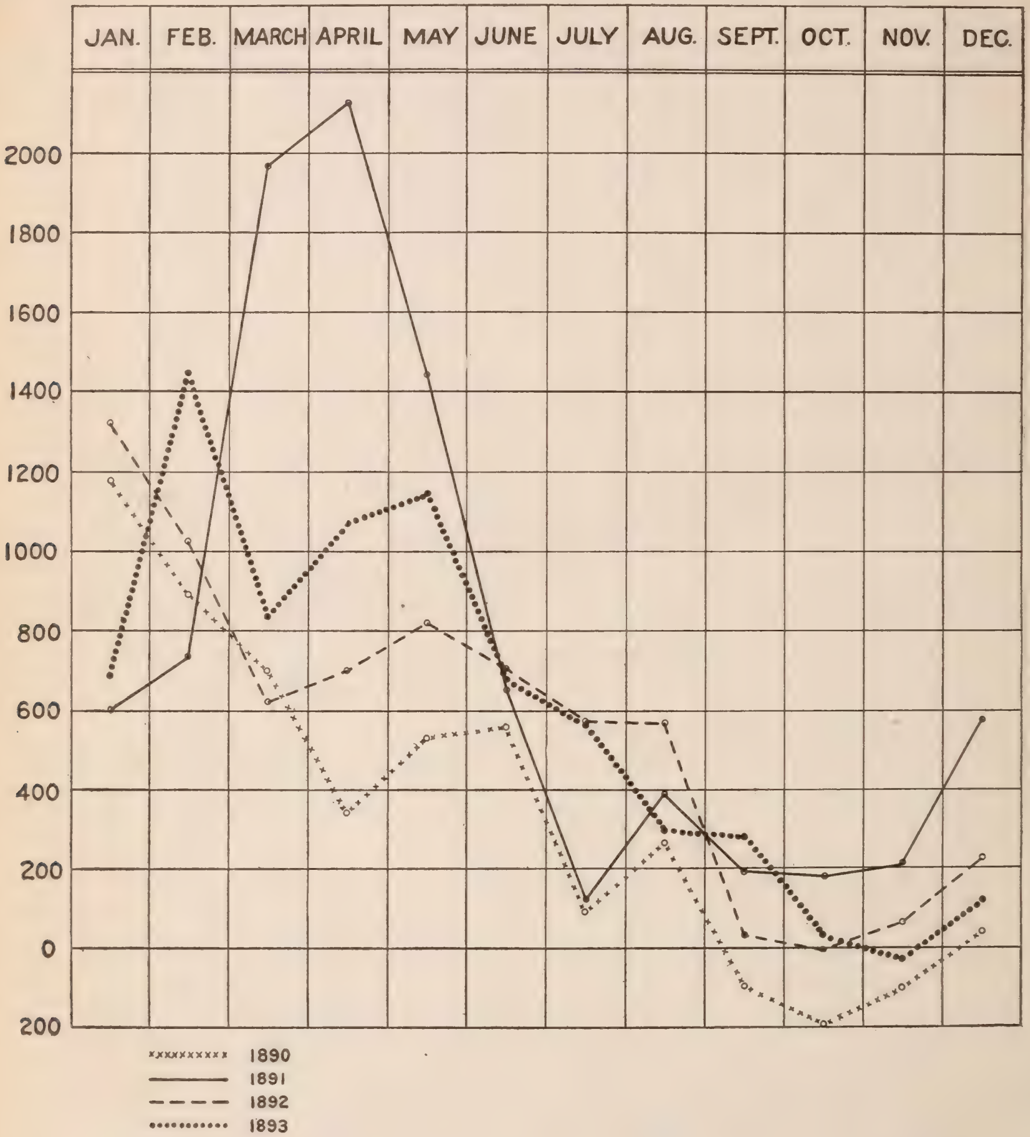

Diagram No. 2—Deaths from all causes by months as compared with expected deaths on basis of deaths in 1889 plus 5.2 per cent each year for increase in population. The zero line represents expected deaths. The lines above the zero line indicate number of deaths above the expected. Those below zero line indicate number of deaths less than the expected. Chicago.

Chicago grew at the rate of 5.2 per cent a year. To get the number of deaths normally to be expected in January, 1890, we added 5.2 per cent to the number of deaths which occurred in January, 1889. This process was repeated for each of the twelve months. To get the number of deaths expected in January, 1891, we added 5.2 per cent to the number of expected deaths for January, 1890. This process was repeated for each month. The same plan was followed in arriving at the expected deaths for the months of 1892 and 1893. In this way we established our base line for Diagram 2.

Diagram 2 shows how much the deaths each month rose above or fell below the base line. The death-rates were heavy in the respiratory disease months and light in the late Summer, Autumn and early Winter. We think that this diagram proves that the effect of influenza was felt each late Winter and Spring until and including 1893.

The gross death-rates for the several years were: 1889, 18.12; 1890, 19.87; 1891, 24.16; 1892, 21.85; 1893, 21.61; 1894, 18.26; 1895, 17.72; 1896, 16.29.

Diagrams 3 and 4 are reproductions of sections of charts found in the Report of the Chicago Health Department for 1911. They show that the pneumonia and bronchitis death-rates rose sharply in 1890 and continued high until 1893. After 1893 the prevalence of these diseases was markedly decreased. We need scarcely add that between 1890 and 1893 physicians habitually made many clinical diagnoses of influenza and many deaths from this disease are recorded each year. Nevertheless it is our opinion that the gross deaths reflect the effect of the epidemic even more than do the records as to pneumonia, bronchitis and influenza.

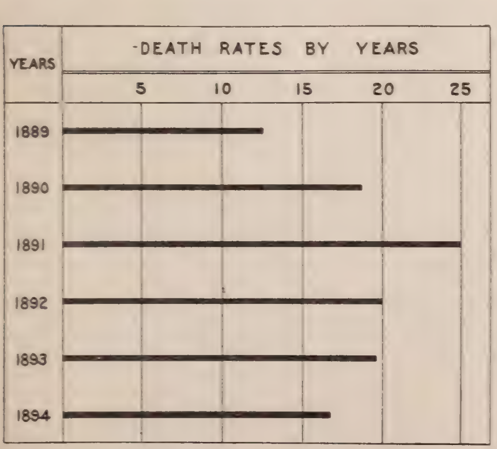

Diagram No. 3—Number of deaths from pneumonia by years 1889 to 1894. Chicago.

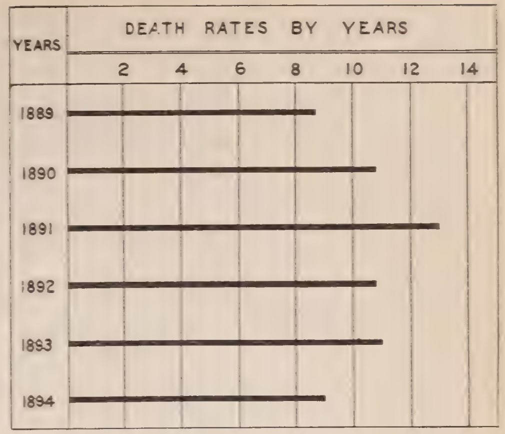

Diagram No. 4—Number of deaths from bronchitis by years 1889 to 1894. Chicago.

Diagram 5 shows a part of the age distribution of excess deaths over normal from all causes in 1890–93. The base line was established in the same way as in the case of Diagram 2. This diagram shows that influenza-pneumonia, caused the largest excess of death over the expected in the group "over 60".*

The most significant showing on this diagram is the line for children 5 to 10. This group was picked out for entry on the diagram because it more nearly represented school children than any other age group in the classification. This line indicates that the disease has a distinct tendency to spare children of school age. It furnishes an argument against the closing of schools as a means for controlling an epidemic of influenza.

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* Although the excess deaths *over normal* were more numerous in the age group "over 60", the *total deaths* were greater in the age group "20–40".

Conclusions:

First: Pandemics of influenza usually continue for several years.

Second: The epidemic in Chicago in 1890 continued to recur or else to otherwise increase the mortality rate of Chicago up to and through 1893.

Third: The principal increases in deaths were due to pneumonia, bronchitis and influenza.

Fourth: The number of deaths was highest among persons 20 to 40. The greater increase above the expected was in death of persons over 60. Chart 5 shows that children of school age seem to enjoy some relative immunity.

Fifth: This study indicates a probability either that influenza will recur several times during the next few years or that there will be an increase in pneumonia, or both.

Sixth: This study plainly indicates a need for continued work to control the acute respiratory diseases during 1918, 1919 and for several years thereafter.

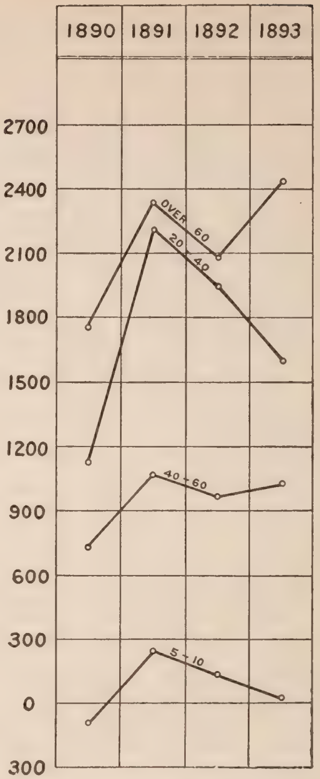

Diagram No. 5—Deaths for four years in certain age groups as compared with expected deaths on basis of deaths in 1889 plus 5.2 per cent each year for increase in population. The zero line represents expected deaths. The horizontal lines above zero line indicate numbers of death above the expected. Those below zero line indicate numbers of deaths below the expected. Chicago.

◆

WILL YOU BE READY NEXT YEAR ?

If the Influenza Epidemic should be repeated next year, will you be able to face your people and say: "I am ready?"

The highest authorities will present all of the available information regarding Influenza at the Meetings of the American Public Health Association at Chicago, December 9-12. Headquarters, Hotel Morrison.

Play safe. Prepare for next year. Do not gamble with the lives in your care.

PRELIMINARY REPORT ON THE INFLUENZA EPIDEMIC IN CHICAGO.

JOHN DILL ROBERTSON, M. D.
Commissioner of Health
AND
GOTTFRIED KOEHLER, M. D.
Assistant Commissioner of Health, Chicago.

THE influenza epidemic which has just swept across the country first manifested itself in the death-rate of Chicago on September 22, 1918. This was approximately fourteen days after the first outbreak of the disease in the Great Lakes Naval Training Station, which is located thirty-two miles north of Chicago. In the interval the disease had spread through the north shore suburban towns.

The following charts show the course of the disease to November 2, the sixth week of the disease. Chart I shows the number of cases reported daily and Chart II the number of deaths.

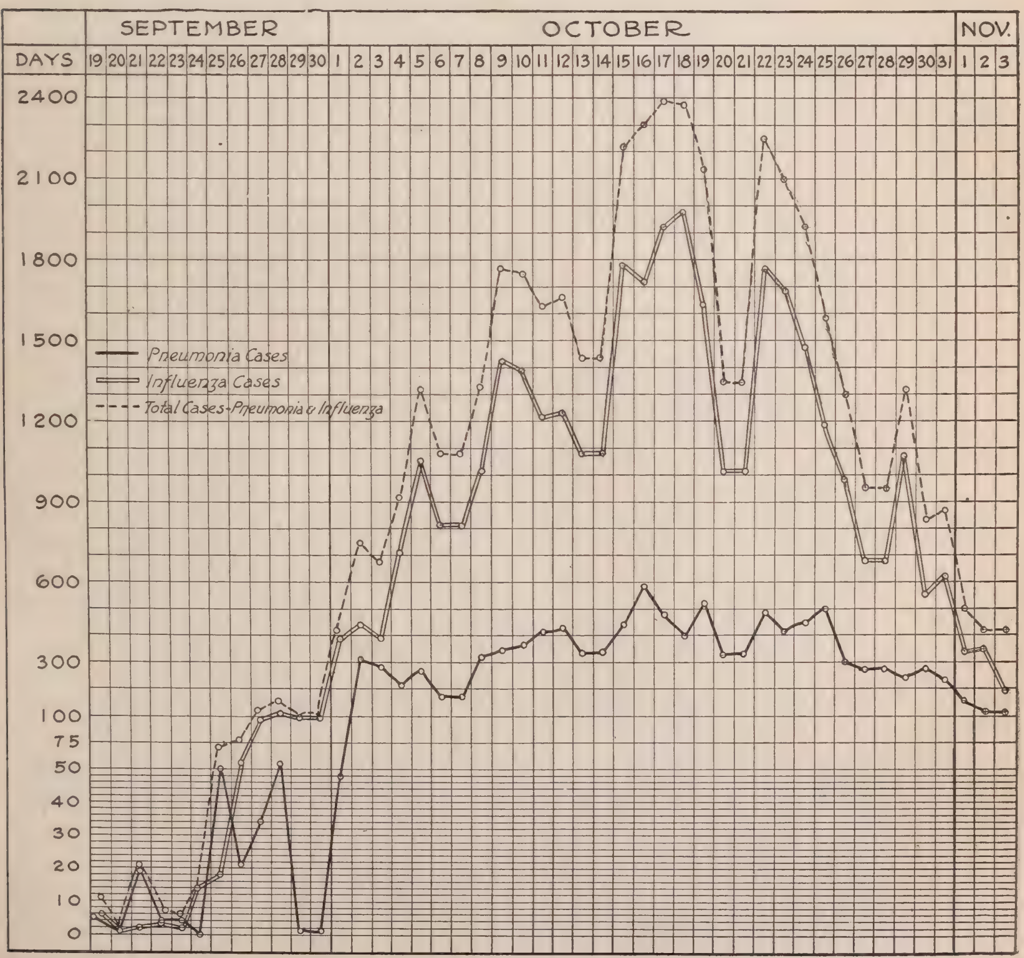

CHART I

The daily number of deaths is undoubtedly the best index of the course of the disease. Influenza was first added to the list of reportable diseases with the advent of the present epidemic. This fact, together with the stress under which physicians labored during the epidemic, renders the number of cases reported daily a less reliable guide.

The outbreak in Chicago reached its height on October 17. This was at the beginning of the fifth week and the twenty-ninth day of the disease. On that day the total number of deaths from influenza and pneumonia was 381, the total deaths from all causes 520 and the total number of new cases of influenza-pneumonia reported was 2,395. All of these figures

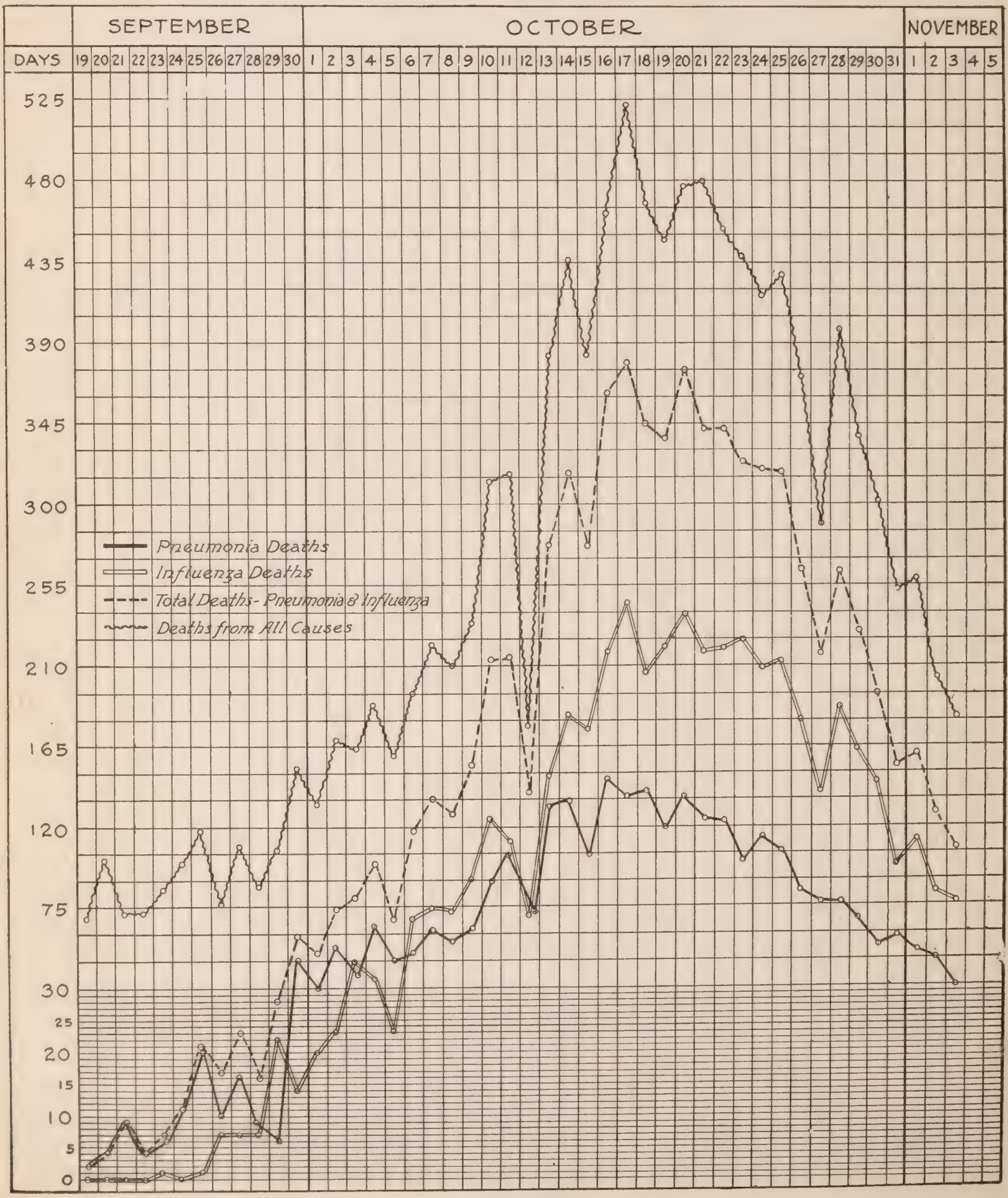

CHART II

TABLE I. ANNUAL MORBIDITY AND MORTALITY RATE PER 1,000 OF POPULATION.*

Week Ending	Cases of the Disease Reported	Deaths			Total, All Cases
	Influenza and Pneumonia	Influenza	Pneumonia	Influenza and Pneumonia	
Sept. 28	6.94	0.34	1.48	1.82	12.5
Oct. 5	64.21	3.43	4.94	8.37	20.3
Oct. 12	202.21	11.46	9.55	21.01	33.1
Oct. 19	282.47	24.93	17.33	42.26	57.6
Oct. 26	255.32	30.94	16.58	48.27	63.0
Nov. 2	138.91	20.36	9.15	29.51	44.0

* Based on United States Census Bureau estimated population of 2,596,681 for 1918.

represent the maximum number recorded in any one day during the outbreak.

The highest weekly mortality rate occurred during the week ending October 26, when the annual rate per 1,000 from all causes was 63, and from influenza and pneumonia combined was 48.28. Since the date of the greatest incidence there has been a gradual decline both in the number of new cases and the number of deaths from influenza and pneumonia and all causes. During the week ending November 2 the death-rate from all causes had declined to 44.0 and from influenza and pneumonia to 29. 51.

Reduced to terms of annual rates per 1,000, the morbidity and mortality rates from influenza and pneumonia and all cases during each calendar week during the course of the epidemic were as shown in Table I.

A study of the progress of the outbreak in the city, using as an index the number of deaths from influenza and pneumonia, shows that the disease first manifested itself to a greater extent on the north side, spreading apparently to this part of the city from the north shore towns. During the first two weeks of the disease it continued to show a preponderance on the north side, in the third week, an even distribution in all parts of the city, in the

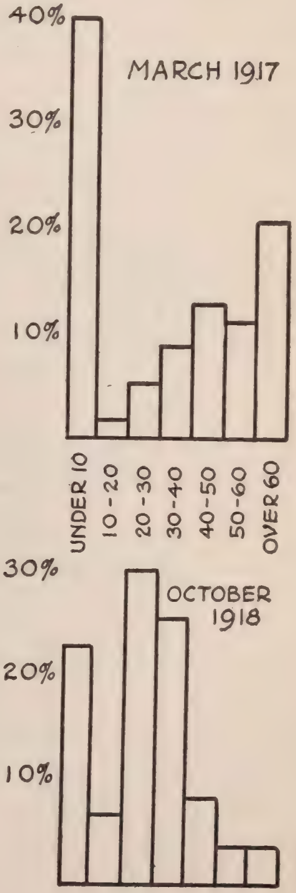

CHART III

PERCENTAGE OF DEATHS FROM INFLUENZA & PNEUMONIA BY AGE GROUPS fourth week it spread more to the south and southwest sides, and after that affected the latter sections of the city with greatest severity.

A study of the age distribution of the deaths from influenza and pneumonia shows that the largest percentages of deaths occurred in persons between twenty and forty years and under ten years of age. The percentage distribution of all deaths from influenza and pneumonia during the month of October, 1918, by age groups is shown in the lower diagram of Chart III.

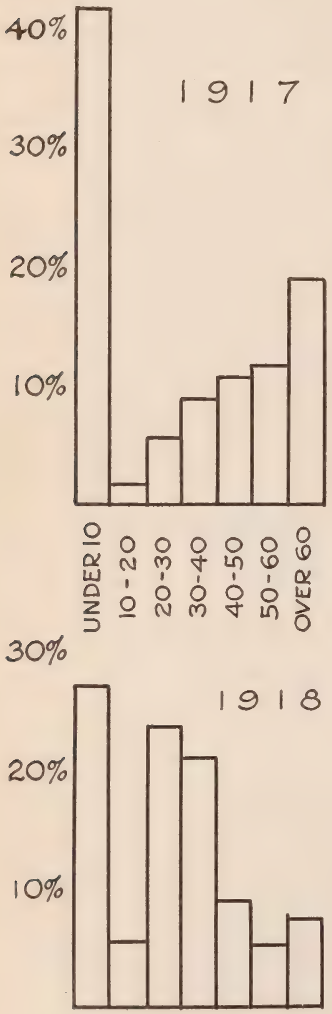

CHART IV

PERCENTAGE OF DEATHS FROM INFLUENZA & PNEUMONIA BY AGE GROUPS

The contrast is here also shown between the age distribution in the deaths occurring during the present outbreak and the deaths from pneumonia during March, 1917, when this disease was unusually severe, the annual rate being 3.61 per 1,000 during this month.

The winter of 1917 was characterized by a high pneumonia death-rate in various parts of the country. Not only the army camps, but many cities were severely afflicted by the disease. The annual pneumonia death-rate in Chicago was also unusually high in this same year and reached 3.22 per 1,000 during the first four months.

The course of the pneumonia and other acute respiratory diseases in Chicago from 1867 to November 1, 1918, is shown on Chart V. The death-rates indicated thereon include pneumonia, influenza and bronchitis.

The unusual prevalence of the disease, during the year preceding the present outbreak, noted in connection with the progress of the influenza epidemic of 1890, 91 and 92, as described by Evans and Heckard in this number of the Journal, leads to the inquiry if the extensive outbreak of pneumonia in 1917 was not possibly the first year of the present influenza epidemic. The conflicting reports on the bacteria responsible for the present outbreak, together with the frequent findings of hemolytic streptococci in the pneumonias studied in 1917, offer further reason for making additional studies to determine the exact relationship of the high mortality from pneumonia occurring in these two successive years.

The dissimilarity in the age incidence shown in Chart III of the deaths from

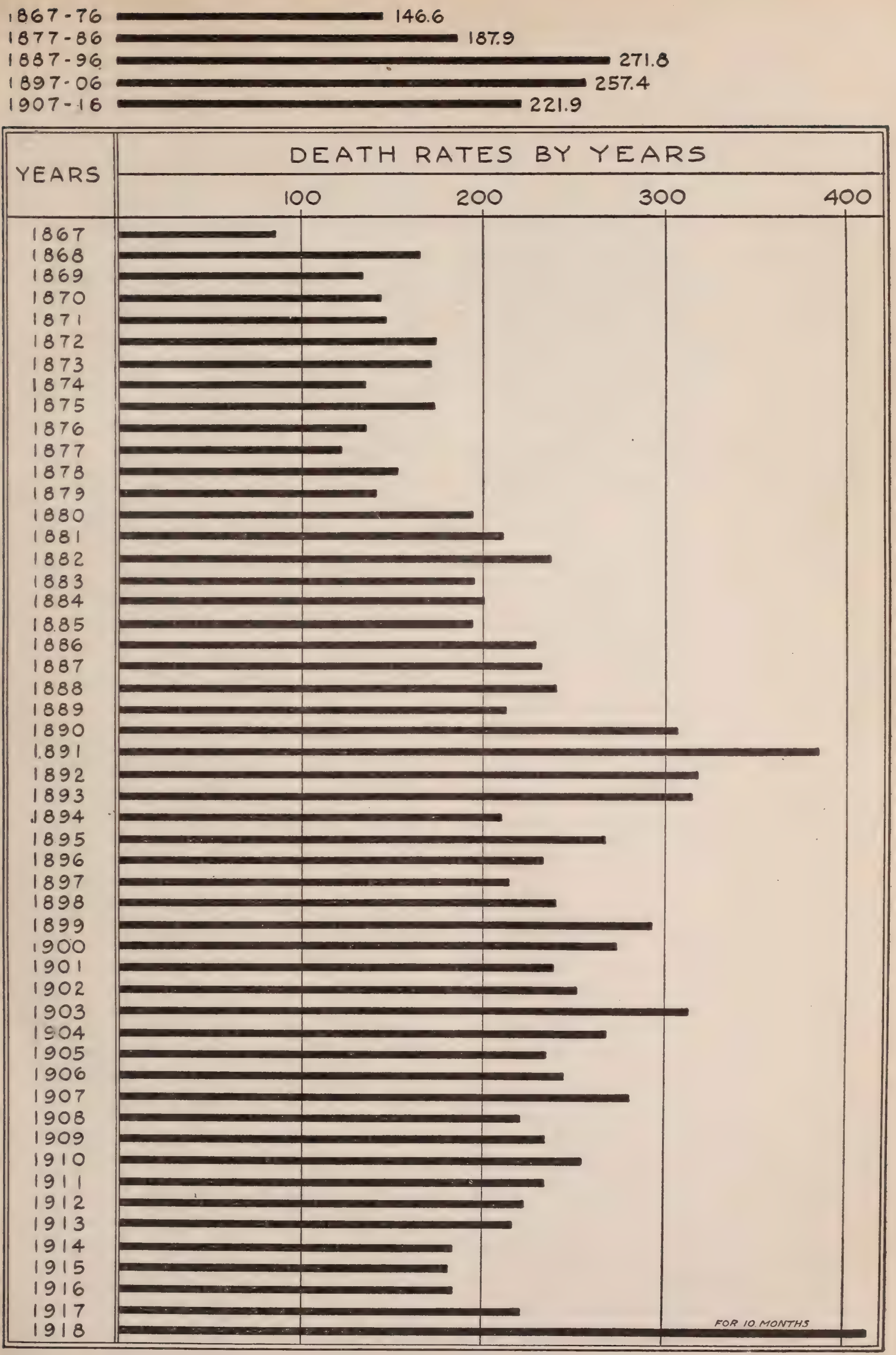

CHART V

ANNUAL DEATH RATES PER 100,000 FROM PNEUMONIA, INFLUENZA & BRONCHITIS IN CHICAGO pneumonia in March, 1917 and October, 1918, is likewise indicated in Chart IV, which shows the precentage distribution by ages of all deaths from pneumonia and influenza occurring in the entire year of 1917 and 1918 to date. The great preponderance of children under ten years affected in 1917 and of the age group from 20 to 40 in 1918, stands out prominently in these charts. Inasmuch as influenza affects principally children and young adults (Osler's "Text Book of Medicine") does this mean that the children were affected in the first year of the outbreak and the young adults in the second year?

SUMMARY OF MEASURES EMPLOYED TO CONTROL THE EPIDEMIC.

Since we were fortunate enough in Chicago to pass through the present influenza epidemic with a maximum annual death-rate from all causes per week, not in excess of 63 per 1,000, it may be of interest to summarize the measures employed to control the spread of the disease. Briefly, these were as follows, on the days of the month indicated by the numerals:

September 16th—After the disease had appeared at the Great Lakes Naval Training Station, issued warning that the epidemic would spread to Chicago within two weeks. 17th—Proclaimed the influenza-like disease a reportable disease. 20th—Police Department requested to start another anti-spitting crusade. 21st—Warning issued that persons having symptoms of influenza should go to bed and not expose others. 24th—Began campaign to have all dwellings well heated and asked citizens to telephone to the Health Department if landlord did not furnish sufficient heat. Placards warning against danger of sneezing, coughing and spitting placed in all street and elevated cars. 25th—Issued warning in regard to pneumonia following influenza. 26th—The following rigid measures adopted to prevent the spread of the disease in the schools: (a) Open window ventilation of all schoolrooms. (b) Pupils warmly dressed. (c) Daily thorough inspection of all pupils. (d) Pupils coughing or sneezing to be sent home at once. (e) Daily check on absentees in all schools. 27th—Pictures in daily papers demonstrating the use of masks. Landlords refusing to supply heat sued. 28th—Health Commissioner appointed on a committee appointed by the Medical Section of the State Council of Defense to mobilize all forces to fight the outbreak in the city and state. 30th—All street and elevated cars required to be renovated and disinfected at least once in twenty-four hours.

October 1st—Quarantine ordered for all influenza cases, also isolation of cases in hospitals. (Pneumonia has been subject to quarantine for a number of years.) 2nd—Further attention called to the value of masks by ordering same to be employed in hospitals. Masks placed on street sweepers. Visiting stopped in hospitals. 3d—Interviews given and printed in all newspapers warning against panic, also urging that all precautionary measures be continued. United States Public Health Service Circular on "Spanish Influenza" carried in papers as a half page "ad," with a subjoined warning against undue fear. Police requested to arrest "open" coughers and sneezers on streets and in public places. 4th—Home nursing provided for by the Visiting Nurses' Association. Check made on hospitals to facilitate prompt hospitalization of all cases. 5th—Churches warned against coughing and sneezing; also required to improve ventilation. 11th—Thirty-five field nurses of Municipal Tuberculosis Sanitarium Staff detailed for home nursery service to coöperate with the Visiting Nurses' Association. 12th—Public dance halls closed. Health Commissioner meets with the presidents of forty civic organizations who agree to coöperate. One hundred and fifty health officers of the city put on full-time service at a salary of $200.00 per month, United States Public Health Service paying the difference. All sworn in as United States employees. Eighteen field nurses from Health Department Quarantine Service loaned to Visiting Nurses' Association. Public funerals prohibited. Attendance at all funerals limited to ten, and burial required from the place of death. 10th—Smoking on all cars stopped. 14th—Conference to facilitate hauling by ambulances. 15th—Theaters, skating rinks, moving picture shows, night schools and lodge halls closed. 16th—Sixteen Municipal Tuberculosis Sanitarium dispensary physicians detailed to field duty for care and treatment of families afflicted with the disease. 17th—Arrangements completed for federalizing health officers of the city; the same also to give treatment to the needy and first-aid treatment to those unable to procure a physician. The manner of obtaining this assistance announced in the public press. Street and elevated cars required to keep doors open, also windows as weather permits. Employees in down-town district ordered to and from work at various hours so as to stagger load on cars. The Influenza Commission recommends general immunization by the use of the Dr. E. C. Rosenow vaccine and appointed a commission, consisting of the professors of bacteriology and pathology in the local universities to manufacture and distribute such vaccine. Manufacture of prophylactic vaccine under supervision of the aforesaid commission begun in the city laboratory. 18th—All public gatherings not essential to the war, such as banquets, conventions, lectures, social affairs, athletic contests of a public nature stopped. Music, cabarets and other entertainments stopped in restaurants and cafés. Crowding prohibited in poolrooms, saloons, etc. Assistance of the school board enlisted to help health officers in carrying out measures which have been employed since the outbreak of the epidemic to guard the health of school children. These measures have been carried out in lieu of closing the schools. 19th—Hospitals canvassed with a view of getting more space for influenza cases. Report received from a representative of the department sent East to study vaccines used there. 20th—Conference with superintendents of all hospitals to arrange for additional space for influenza cases. Ordered that no surgery, except emergency surgery, should be done until further notice. 21st—Further efforts made to cope with shortage of nurses. Request made that physicians send all women over forty, willing to serve as housekeepers in afflicted homes, to the Health Department for registration and reference to the Visiting Nurses' Association. 22d—Rosenow vaccine received from Rochester ready for distribution. Issued in order of preference to draft boards, hospitals and nurses, industrial plants and general public. 23d—In conference with laboratory men

VACCINE DISTRIBUTED TO NOVEMBER 3 AS FOLLOWS:

October 22	2,813 cc.*
23	2,183 cc.
24	8,206 cc.
25	4,131 cc.
26	5,925 cc.
27	272 cc.
28	8,232 cc.
29	2,288 cc.
30	66 cc.
31	11,628 cc.
November 1	9,765 cc.
2	6,033 cc.
3	48 cc.

* One cc. is the average amount of one dose. Three doses required at weekly intervals.

of all hospitals and laboratories. Urged that they make preparations at once to collect and administer immune human serum. 24th—Check up on street cars to see if all available cars are used so that crowding be reduced to minimum. 25th—During cold spell the public warned to wear heavy clothing, also warned as to the dangers of cold and wet feet. 29th—Ban lifted on music and usual entertainment in restaurants. 30th—Theaters allowed to reopen on north side of the city, the next day in the middle and business section, and later on the south side portions of the city. Thorough renovation of all theaters required as a condition for a permit to reopen. Two-minute health talks given at each performance, and watch kept on coughing, sneezing and spitting. Ban also lifted on other public meetings in theaters and assembly halls on the same date as for theaters, but all theaters and meetings allowed to reopen required to close at 10 p. m.

November 4th—Ban lifted on social functions, entertainments and athletic contests. Public dance halls, skating rinks and lodge halls allowed to reopen after thorough renovation and inspection, and approval by the Department.

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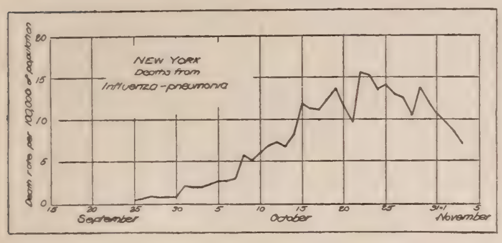
Recent Public Health Work.—Dr. Joseph Priestley, Medical Officer of Health for Lambeth, England, reviews the recent progress in public health work as outlined in the forty-sixth annual report of the Local Government Board, for 1916–1917.

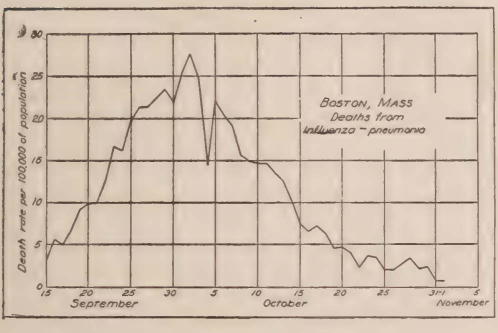
With the single exception of measles, all the other infectious diseases were under complete control. Many anthrax cases were traced to infected shaving brushes which had been made of Chinese horse hair. A large amount of food inspection has been done, due essentially to the needs of the army. Anti-tuberculosis work remains, however, in a state of *status quo* because so many able tuberculosis workers are in the army service. On the other hand maternity and child welfare work has made unusual progress. During 1916–1917, the infant mortality rate was the lowest on record. The results on the dried milk experiments are reviewed, and it is stated that dried milk is a valuable food and can even be used as food for infants. Steps have also been taken to insure an adequate and safe drinking water supply in factories and workshops, where twenty-five or more persons are employed. It is recommended that the bubbling fountain, which throws the jet of water at an angle, should preferably be used. The Ministry of Health which has been formed will combine and coördinate all the public health activities conducted by the national government under one head. Lastly, it is urged that the health of the munition worker be safeguarded in every way. This is the result of a very extensive investigation into the subject of industrial hygiene, sanitation and welfare, which was conducted by a special committee, appointed in September, 1915.—The *Practitioner*, September, 1918, London, England. (*M. P. H.*)

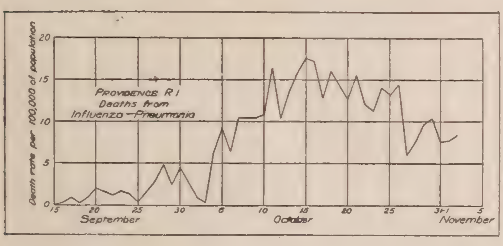
PROGRESS OF THE INFLUENZA EPIDEMIC IN THE LARGER CITIES OF THE UNITED STATES.

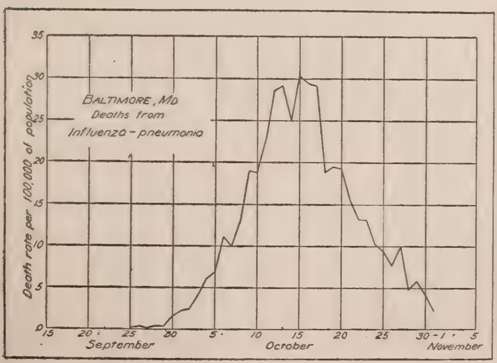
By The Editor.

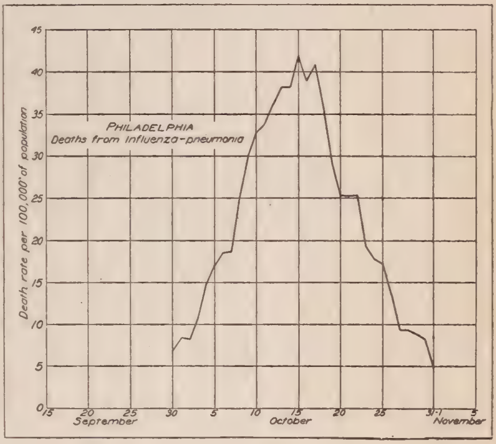
DEATHS FROM INFLUENZA AND PNEUMONIA PER 100,000 OF POPULATION.

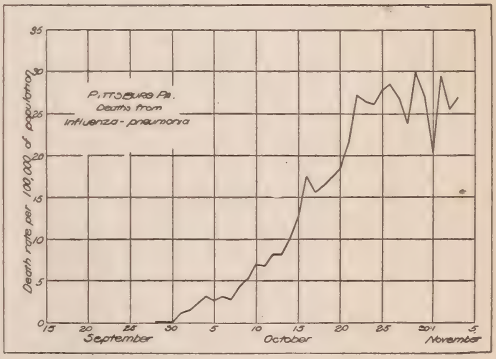


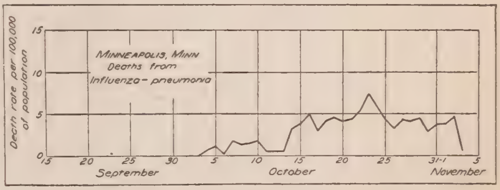


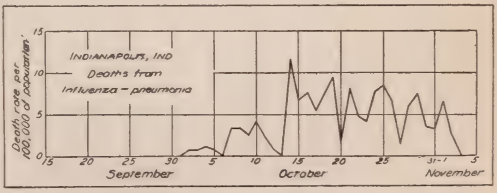


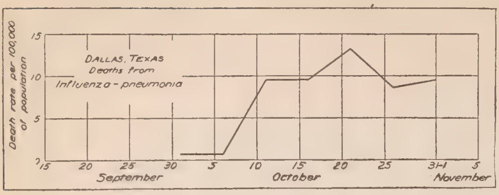


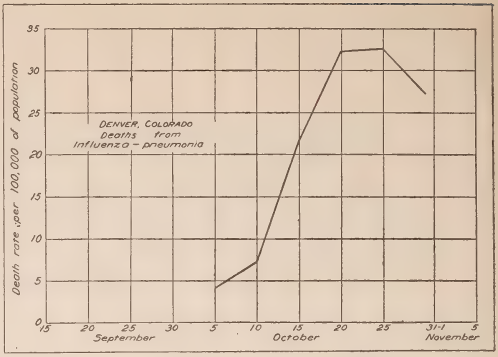


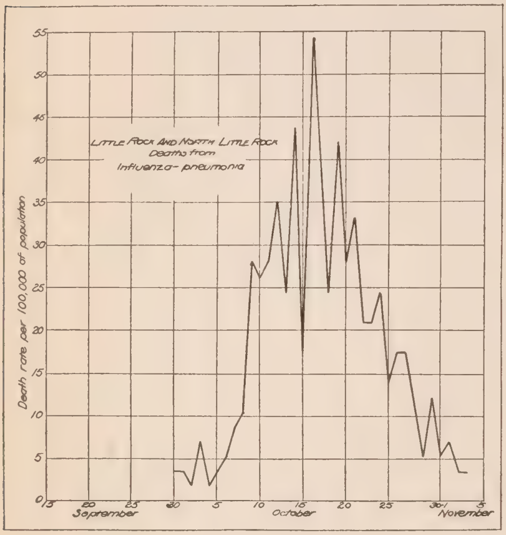


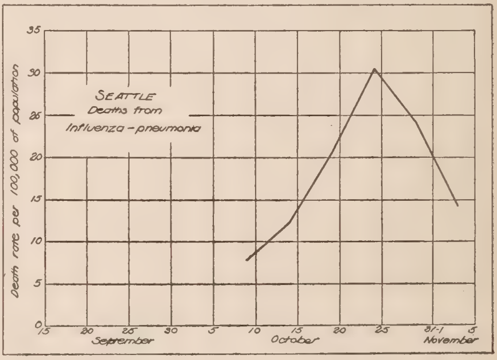


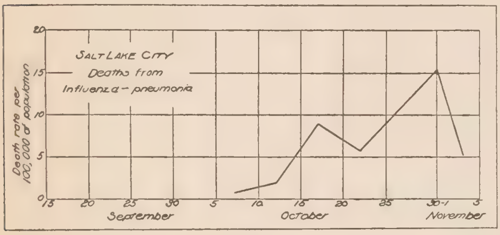


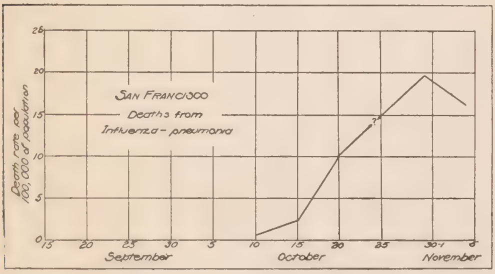












The foregoing charts were prepared under the supervision of Mr. John Ritchie, Jr., from data furnished to the editor through the courtesy of the health officers of the cities in question. The data for the far western cities were sent by telegraph, the deaths being stated for every fifth day, instead of for consecutive days, as were the cases in the more eastern cities.

In so far as possible, the reports were compared with the weekly reports of the U. S. Census Bureau. The deaths reported from Indianapolis were 15% and those from Minneapolis 30% lower than the Census Bureau reports, indicating that possibly the term "influenza-pneumonia" had not been interpreted as including deaths reported under both influenza and pneumonia. It was not possible so to check reports from the far western cities owing to the abridged character of the telegraphic reports. Reports from New York City, Boston and Providence checked well with the Census Bureau reports. Reports from Baltimore and Philadelphia were about 15% higher, possibly because of additional returns being recorded since reporting to the Census Bureau.

While the profiles are not closely comparable from the standpoint of death rates, it is believed that they will still be of value in indicating the relative periods of onset and decline, of present status, and of general courses of the respective local epidemics.—EDITOR.

INFLUENZA EPIDEMIC

City	Deaths from influenza during week ending[a]						
	September			October			
	14	21	28	5	12	19	26
Total	19	193	904	2718	6809	12303	13086
Albany					34	88	152
Atlanta					5	39	101
Baltimore				30	192	564	473
Birmingham	0	0	1	6	52	98	114
Boston	19	172	600	991	850	463	174
Buffalo				7	82	406	591
Cambridge			82	113	100	50	17
Chicago			17	171	571	1242	1541
Cincinnati				3	47	171	262
Cleveland				3	18	94	347
Columbus					15	45	117
Dayton					20	96	94
Denver					34	120	113
Fall River		4	14	86	192	169	87
Grand Rapids						5	7
Indianapolis					30	18	18
Jersey City				16	87		200
Kansas City, Mo.				26	75	113	118
Los Angeles					28	100	244
Louisville					15	26	24
Lowell			16	29	37	31	19
Memphis					13	30	39
Milwaukee					15	30	49
Minneapolis					37	89	128
Nashville					100	146	100
Newark		0	2	31	119	270	294
New Haven			11	30	68	130	154
New Orleans				12	95	447	449
New York		8	46	299	979	2218	2947
Oakland					7	21	111
Omaha					46	138	140
Philadelphia				399	1697	2953	1839
Pittsburg		0	1	12	12	228	119
Portland					0	16	
Providence				61	125	193	175
Richmond	0	1	1	21	89	139	151
Rochester					14	77	185
St. Louis					40	110	158
St. Paul					31	64	47
San Francisco						88	494
Seattle					54	85	153
Spokane					2	14	38
Syracuse			38	125	216	203	108
Toledo					2	29	
Washington, D. C			12	116	387	525	328
Worcester	0	8	63	131	177	122	67

[a] Blank spaces indicate that no report has been received.

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THE AFTERMATH OF THE EPIDEMIC.

During the week, ending October 26, 1918, 502 babies under one year of age died in the City of New York. According to Dr. S. Josephine Baker, Director of the Bureau of Child Hygiene, this is a larger number of infantile deaths than has occurred since the year 1910. In the corresponding week of 1917, there were only 221 deaths under one year of age.

During the week ending October 5, 1918, there were 200 deaths under one year of age, whereas in the corresponding week of 1917, there were 242 deaths. The influenza epidemic in the week of October 5 had not yet reached its maximum. The crude death-rate of this week was 16.3 as compared to 61.6 for the week of October 26.

Similar conditions have been noted in other cities. In Philadelphia, 269 infants under one year of age died during the week of October 26, as compared with 69 for the corresponding week of 1917. In Baltimore there were 127 deaths this year as compared with 28 deaths last year. Chicago showed 251 deaths this year as compared with 105 deaths last year. In practically all of the cities mentioned in the weekly report of the Bureau of the Census, the same conditions prevail. As the epidemic increased in intensity, there was a corresponding increase in infantile deaths.

It has been stated that the present epidemic differed from previous ones in the comparatively small percentage of deaths under fifteen years of age. There is no data available at present to determine whether the infants who have died were sufferers from influenza or pneumonia. It is quite probable, however, that many of them died of neglect owing to the illness of the mother or other member of the family. Statistics for succeeding weeks will probably show a continuation of these high infant death-rates, even after the epidemic is on the wane.

It is the irony of the situation that the year 1918 is "Children's Year." It was stated when the campaign of "Children's Year" began that it was hoped to save the lives of one hundred thousand babies. It is probable that 1918 will stand out as a year of high infant mortality.

What will happen after the epidemic is over? What will happen to the thousands of mothers who have had influenza and pneumonia and who are now convalescent? Will there be sequelæ as a result of the weakened condition in which many of these sufferers now find themselves? How many more babies will die as a result of improper care and attention? How many more cases of tuberculosis will develop during the coming winter and spring as an aftermath of the epidemic?

What are health officers doing to meet this situation? In how many communities are campaigns of public health education being planned advising citizens to undergo periodic medical examinations? In how many cities will facilities be provided in the shape of dispensaries, clinics, etc., in which convalescents can receive advice, instruction and examination? Which health officers are looking forward to the possibility of a recurrence of the epidemic in the early spring or next year and are making plans accordingly?

L. K. F.

INFLUENZA AND THE COMING ANNUAL MEETING.

The great epidemic has been a teacher as well as a destroyer. It is therefore planned to make influenza the most important subject of discussion at the annual meeting to be held at Chicago, December 9–12.

By that time, we shall be in a position to review the statistics of the epidemic: to trace the course of the disease from the East, through the European countries, and finally through our own land. We shall be able to say with reasonable accuracy what was the toll of the scourge as to deaths, and we shall be able to estimate the number of cases.

The discussion of research problems should be of the highest value: whether the causative organism is invariably *B. influenzæ;* the prevalence of the carrier condition; the value of vaccines of various types; the results with immune sera; and the value of the face mask.

The disease itself will be considered from the standpoint of symptoms, pathology and especially the complications and sequelæ, such as pneumonia. Experience in past epidemics has shown that we are by no means through with influenza, but must remain vigilant and active for several years at least.

The merits of the various types of treatment will be discussed in detail, and the most interesting results obtained with the open air hospitals will be presented.

Concerning administrative control a dozen questions immediately come to mind: What prophylactic measures have been found worth while? Does the stagger-hour transportation system help? At what point does it pay to close schools?

The saddest shortcoming revealed by the epidemic was the lack of a detailed plan for meeting exactly such a catastrophe: for mobilizing our medical, nursing, hospital, and relief forces upon the appearance of the first local outbreaks. We shall never be found in a similar predicament, for from the devastation of this epidemic will follow preparations against its repetition which will rival in thoroughness the most efficient planning of a great military offensive.

Now, as never before, the public has been aroused to the necessity of preventive medicine, universally applied. The American people, who furnished fifteen billions to fight the Hun, will readily see the wisdom of properly financing the fight against the enemy, disease, which in two months killed many times as many Americans as the German destroyed in a year.

Every health officer should come to the annual meeting prepared to take back to his community the lessons taught by the epidemic. It is hoped that members of the Association will take particular pains to bring with them to the meetings as many of their acquaintances as possible among the profession.

A. W. H.

WHAT INDUSTRIES MAY WOMEN ENGAGE IN?

Women are capable of doing any and all kinds of work. It is not a question of women and industries but of the individual woman and the individual job. If the woman is properly selected through physical examination and is allowed to work under medical supervision and the occupation is conducted subject to the standards set for hygiene, sanitation, and accident prevention, women can do any sort of work which men can do.

The writer quite agrees with Mrs. Florence Kelly* that women in relation to work should not be considered in a mass, but there are certain groups of women and women at certain periods of life who are capable of applying themselves to work just as efficiently as men. Mosher and Martin† have concluded as a result of their investigation upon the physical powers of women that sex, as such, is not a disability. Dr. Mary A. S. Deacon,‡ after a medical supervision of about one thousand women in a munition plant in Great Britain, comes to the conclusion that even pregnancy is not to be considered a bar to employment, but in fact results in rather a better condition of health, where employment is allowed, subject to medical supervision.

Some women, otherwise able, should not be allowed to engage in any gainful occupation for social reasons such as the care and raising of a family, but if the average woman is given equal opportunity to acquire skill and experience and to adapt herself to her job, there seems no just reason for believing that if the job is not enhampered by various forms of health hazards, she may not do just as much as a man without detriment to her health.

As regards heavy work, it is to be noted that women are about nine-tenths the equal of men as to red blood corpuscles, that their bony skeleton is rather slighter, height to height and weight to weight, and that they may not have quite an equal reach. Even these features may be but the result of a lack of opportunity to use their bodies in ways similar to men. It may come as a blessing to men that permission is given women to work in certain industries, upon the condition that certain health and accident hazards are to be removed. It may humanize industries more. This should not be taken as an argument that men can stand things which women cannot. Men cannot and do not stand them.

E. R. H.

THE INFLUENZA PAPERS IN THIS ISSUE.

With the enormous interests in the pandemic of influenza, the JOURNAL again presents in this issue a number of papers upon the subject. All of these have been prepared in relatively short time and are, therefore, not as complete as they might be were not prompt publication so desirable.

We have first two papers dealing with studies made in Chicago. We have also reproduced one of the emergency reports prepared by the United States Census Bureau. The Bureau deserves great credit for the promptness with which the Weekly Mortality Reports and special reports are manifolded and distributed.

Finally, believing that a brief graphic presentation of the situation might be of value, the JOURNAL presents profile charts based upon death reports from fourteen large cities in various parts of the country. To the departments which furnished this information, the thanks of the Association are due for promptness and courtesy with which the returns have been made. The more distant cities have replied by telegraph and in these cases the curves are based upon five-day intervals rather than upon daily intervals.

Only fourteen cities are represented on the charts although twenty-one departments sent in returns. It was necessary to restrict the number of charts in order not to delay publication unduly.

A résumé of the statistics furnished is given in Table I herewith.

Owing to the limited time available it is felt best to leave the drawing of conclusions to the reader rather than to make any observations which would necessarily have to be based upon a very cursory examination.

The curves are all drawn on the same scale per hundred thousand population and are, therefore, comparable with one another from this standpoint. However, it is well to bear in mind that in the time of an influenza epidemic many deaths will be reported as due to this disease which should have been assigned to another cause. A more reliable index would have been the charting of the excess of the total death-rate over the rate for the corresponding period for the last five years.

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*Problem of the Married Woman in Industry. Bull. Penn. State Dept. of Labor and Ind., Vol. V, No. 1, 1918.

†The Muscular Strength of College Women. Jour. Amer. Med. Assoc., Vol. 70, No. 3, Jan. 19, 1918.

‡Thoughts on Employment of Pregnant Women in Munition Factories. The Lancet, London, Sept. 7, 1918.

TABLE I.

City	Approximate Dates		Statistics per 100,000 of Population to Nov. 3.	
	First Cases	Peak of Deaths	Reported Case-Rate	Total Death-Rate
		October		
Boston		2		563
Providence		15		381
New York	Sept. 12	22	2,180	311
Philadelphia		15		708
Baltimore	“ 23	15	3,486	447
Washington	“ 21	12	7,047	517
Norfolk	“ 20	13	9,500	332
Dallas		21	6,770	244
Buffalo	“ 1	19	5, 73	437
Pittsburg	Oct. 1	29	3,000	533
Wheeling	“ 4	22	1,184	106
Indianapolis	Sept. 28	19	2,270	130
Milwaukee	“ 26	22	1,995	82
Minneapolis	“ 27	23	2,510	99
Chicago	“ 19	17	1,412	311
Des Moines	Oct. 1	17	2,000	61
Little Rock	Sept. 16	16	1,724	636
Denver		18	1,644	147
Salt Lake City		31	2,587	170
Seattle		24	3,018	122
San Francisco		31	4,816	338

A further discrepancy probably arises from varying methods in reporting influenza deaths due from certain joint causes, such as tuberculosis, Bright's disease, etc.

A. W. H.

PROGRAM CHANGES FOR THE ANNUAL MEETING.

In so far as possible it is planned to follow the same relative arrangement of sessions as was announced in the September issue of the Journal. For example, the papers originally scheduled on a Monday will be held on the Monday session in December. One exception, however can be announced at this time: the Laboratory Section meetings which were to have begun on Tuesday will begin on Monday afternoon, December 9. It follows that all of the sections with the exception of Sanitary Engineering will have their first meetings on Monday afternoon, December 9, at 2.00 p. m. The Sanitary Engineering Section will have its first meeting on Wednesday morning, December 11.

A number of new papers have been added to the section programs. The Laboratory Vital Statistics and Sociological Sections will have a number of papers on influenza. Since, however, all of the additions cannot be given at this time, it is thought best to reserve these for the final program.

As has been repeatedly stated elsewhere in the Journal, emphasis will be placed in the programs of the general sessions upon two new subjects: influenza and post-war health problems.

◆

The National Association for Public Health Nursing will have Special Meetings in Chicago following the A. P. H. A. Sessions. The Meetings will be held on Thursday Evening, December 13. Headquarters, Hotel Morrison. For further information, address the Secretary at 156 Fifth Avenue, New York City.

A SIMPLIFIED FUCHSIN SULPHITE (ENDO) AGAR.

Max Levine,

From the Laboratories of the Engineering Experiment Station and Department of Bacteriology, Iowa State College, Ames, Iowa.

THE Endo medium has been used for many years for the isolation of *B. typhosus* and members of the intermediate group. Recently it has been finding considerable favor as a confirmatory test for *B. coli* in positive presumptive tests in water analysis. The medium has given very variable results in the hands of different observers and consequently many modifications for its preparation have been proposed. Considerable emphasis has been put, in the past, on the necessity of a proper reaction and explicit details are usually given for the careful adjustment of the reaction by the addition of sodium carbonate or other alkali.

It has been quite firmly established by work of Clark and his associates of United States Department of Agriculture, that adjustment of the reaction, as ordinarily carried out in preparation of bacteriological cultural media, using phenolphtalein as an indicator, is quite unreliable as it yields relatively little information as to the true acidity of the complex medium. It seems that it would be far preferable to employ a medium in which the reaction is automatically adjusted and that such a medium would very likely give more concordant result in the hands of different investigators. It appears also that the media ordinarily employed is much more complex than is necessary for a rapid growth of the colon typhoid group.

With pure cultures of *B. coli*, *B. aërogenes*, *B. typhosus*, *B. para typhosus A and B*, *B. enteritidis* and *B. cholera suis* excellent growth and differentiation has been obtained on a medium of the following composition:

Distilled water	1000 grams
Dipotassium phosphate	2 to 5 grams
Agar	15 to 30 grams

The ingredients are boiled until dissolved and any loss due to evaporation is made up with distilled water. The agar is then flasked, placing definite quantities in each flask, and sterilized for 15 minutes at 15 lbs.

No adjustment of reaction is made. Filtration of medium is not necessary when used for plate cultures, which are inoculated on the surface.

Just prior to use, the following materials are added to each 100 cc. of melted agar:

1 gram or preferably 5 cc. of 20 per cent lactose solution

½ cc. of a 10 per cent alcoholic solution of basic fuchsin

2½ cc. of a freshly prepared 10 per cent solution of sodium sulphite, which has been heated for a few minutes in the Arnold, or brought to a boil over the flame.

Plates are poured, allowed to harden in incubator, and inoculated in the ordinary way.

The members of the intermediate and typhoid group grow very well upon this medium. Some colonies are often about 3 mm. in diameter in 24 hours. The colonies are transparent and colorless, or they may show a very faint yellowish or amber tint.

The colonies of *B. coli* and *B. aërogenes* are larger than those of the typhoid and the intermediate group. *B. coli* forms deep red button-like colonies, which have a greenish metallic sheen when viewed by reflected light. They are usually 4 millimeters or more in diameter when well isolated. The *B. aërogenes* group do not show the metallic luster. They are lighter colored. They are usually considerably larger than those of *B. coli* and markedly convex.

If the concentration of dipotassium phosphate is one-half per cent, differentiation between *B. coli* and *B. aërogenes* is very marked, but some strains of *B. coli* do not develop the highly colored reaction for 36 hours, which tends to obscure the differentiation between these two types. If the concentration of the phosphate is reduced to 0.2 per cent, the medium colors more rapidly on exposure to light and although the distinct reaction of *B. coli* is hastened, many of *B. aërogenes* strains may develop a metallic luster which is undesirable in attempting to employ this medium for differentiation of *B. coli* from *B. aërogenes.* For isolation of typhoid and para typhoid it is felt that 0.2 per cent K_2HPO_4 is preferable.

The work with this medium in this laboratory has been practically confined to pure cultures. In a few instances the simplified fuchsin sulphite (Endo) agar was employed to confirm positive presumptive tests for *B. coli* with very excellent results.

If this medium works out as well with routine samples as it has with pure cultures it may well be substituted for the standard Endo because of the ease and rapidity of preparation and simplicity of its ingredients.

◆

INFANT MORTALITY ASSOCIATION MEETS WITH A. P. H. A.

The American Association for the Study and Prevention of Infant Mortality will meet at the Congress Hotel, Chicago, December 5-7. There will be a Joint Session with the American Public Health Association on Saturday Afternoon, December 7 at 2 o'clock, at Congress Hotel. The Program will be a Symposium on Rural Health Administration.

For Programs, etc., write to the Executive Secretary, A. A. S. P. I. M., 1211 Cathedral Street, Baltimore, Maryland.

◆

'JUST THE SAME AS ALL THE REST, IT IS TABLE D'HOTE FROM NOW ON'
THE ALLIED RESTAURAN
The FRENCH PEOPLE
The ENGLISH PEOPLE
'WHAT CAN I HAVE THAT'S SPECIAL?'
The AMERICAN PEOPLE
The ITALIAN PEOPLE
The BELGIAN PEOPLE
U. S. FOOD ADMINISTRATION

In Memoriam.

DR. F. F. WESBROOK.

Another of our presidents has been added to the list of those whose labors in Science and Public Health are ended, in the death of Dr. F. F. Wesbrook, President of the University of British Columbia, who died at Vancouver on October 20, 1918.

He was born in Brant County, Ontario, in 1868 and spent his youth in the vigorous surroundings of a new prairie community in the rapidly growing city of Winnipeg.

Graduating from Manitoba University in 1887, Doctor Wesbrook studied medicine in Winnipeg and McGill and later spent several years in the laboratories of the University of Cambridge, returning to Canada as one of the best equipped students of his time in the field of biology, to which most of his later life-work has been given.

His most extended work was done in connection with the State Board of Health of Minnesota and in Minnesota University. As first state biologist his studies were especially applied to the contagious diseases of men and animals; while amongst his most notable studies was that in 1899 on the variable morphology of the *Bacillus diphtheriæ* with which seemed associated definite differences in virulence. When later Professor Wesbrook became the head of the biological department in the University Medical School and still later Dean of the Faculty, his splendid executive qualities were given a full opportunity for their exercise. Endowed with ample funds through the university lands, this medical school rapidly took its place as one of the most modern in equipment and methods, pervaded in an unusual degree with the most advanced teachings of biology in relation to medicine.

Strong in his attachment to the land of his birth and in enthusiasm for constructive educational work, Professor Wesbrook gladly accepted the task of going to the young Province of British Columbia to organize what is to be the great university of the Pacific coast of Canada.

During the many years of Doctor Wesbrook's association with the Minnesota Department of Health, he was one of the most active members of the American Public Health Association. Not only did he present many papers to the Section of Bacteriology and Chemistry, but also read others of a more general character. In his annual address as President in 1905 at Boston, on "Coördinated Specialism in Public Health Work," he forecast changes which the Association must make to meet the rapidly broadening outlook of public health work.

In his death the Association loses one of its most cultivated and useful members; science and education will be poorer for his too early demise and his friends will long miss the cheery smile and kindly friendship of one who was always ready to assist in anything which aimed to increase the happiness of humanity. With them we say *Addio amico!*

—PETER H. BRYCE, M. D.

DOCTOR C. S. CAVERLY.

On October 16, Dr. Charles Solomon Caverly died at his home in Rutland, Vt. of complications following influenza. Doctor Caverly had been a member of the Association since 1894, and at the time of his death was a member of the Board of Directors. He had been associated with the Vermont State Board of Health as President, since 1891.

Doctor Caverly was born in 1856 at Portsmouth, N. H., and was educated in the same state. His medical education was received at the University of Vermont, and at the College of Physicians and Surgeons at New York. He soon became associated with public health activities, and remained an active worker to the time of his death. In both poliomyelitis and tuberculosis he became an authority. In 1894, he published in the *New York Medical Record* (December 1, 1894), the original report of the first extensive epidemic of poliomyelitis reported to the medical profession in this country. More recently, he has been associated in this same work with Flexner, Amoss, Lovett, and others. At the University of Vermont, he was Professor of Hygiene.

He was a kindly man, and an energetic and public-spirited worker. His departure will be mourned by many.

ASSOCIATION NEWS

By the Secretary, A. W. Hedrich.

REPORT UPON AN AUDIT OF THE BOOKS AND ACCOUNTS OF THE AMERICAN PUBLIC HEALTH ASSOCIATION FOR THE YEAR ENDED AUGUST 31, 1918.

October 7, 1918.

American Public Health Association,
126 Massachusetts Avenue, Boston.

Gentlemen: In accordance with your instructions we have made an audit of the books and accounts of your Association for the year ended August 31, 1918.

We present the results of our examination in the following exhibits:

Exhibit A—Comparative Balance-Sheet as of the Close of Business August 31, 1917 and 1918.

Exhibit B—Comparative Statement of Income and Outgo.

Treasurer's Cash, $2,226.46:

We have verified the balance of the treasurer's account as shown by the ledger with the bank statement and have found same to be correct. We have footed and cross-footed the total of cash receipts by months and have traced all receipts to bank. All checks drawn by the treasurer had proper authorizations for payment, signed by your president and secretary.

Secretary's Cash, $276.31:

The secretary's cash account as shown by the ledger was found to be in balance with the bank statement. We have traced all cancelled checks drawn by the secretary in payment of current expenses through the cash book, footed and cross-footed the disbursements for each month. All checks drawn by the treasurer to the Association to reimburse the secretary's fund have been properly accounted for in the secretary's accounts.

Petty Cash, $25.00:

We have checked all vouchers to the petty cash and have verified footings of same. Cash on hand has been counted amounting to $15.24, and vouchers for expenditures amounting to $9.76 were accounted for.

Inventory, $1,836.40:

The inventory as shown in balance-sheet consists of a supply of paper amounting to $1,686.40 which was bought from the Rumford Press and is held by them, and $150.00 which is an estimated figure of bound volumes, supplies, stationery, and Association badges. This amount, in our opinion, is conservative as there are about one hundred badges valued at $1.00 a piece on hand.

Office Equipment, $966.35:

This amount as shown on the ledger amounts to $1,186.27 less 10 per cent depreciation which has been charged off for the past two years amounting to $219.92.

Exhibit A.

It will be noted that as in our previous reports no dues or advertising accounts receivable are carried as assets. This is in accord with the policy established some time ago. We are informed, however, by your bookkeeper that on August 31, 1918, there were receivables from dues of approximately $3,500.00 to $4,000.00.

On our last report the Association owed the Rumford Press $1,645.10 for printing. This liability has been paid and current bills to date are also paid.

Exhibit B.

The deficit a year ago was $106.75 and now shows a profit of $5,330.52. The operating income has increased 47 per cent, while the outgo has decreased .5 per cent. The large increase in operating income is due mainly to the increase in corporate memberships which this year amount to $4,340.00.

We note that in the previous year dues from corporate members amounting to $300.00 were credited to individual dues account, while this year a change has been made in your method of accounting and a new account opened for "corporate and sustaining members" to which such receipts are now credited.

You will notice that there has been a large decrease in your Journal subscriptions and an increase of individual dues. This is also due to a change in the method of bookkeeping. Formerly on receipt of five dollars from a member two dollars was credited to Journal subscriptions and three dollars to individual dues. Now the five dollars received from a member is credited direct to individual dues.

Other Comments.

We suggest that a record of receipts by the secretary from the treasurer be made in the secretary's cash book and that the bookkeeper strike a balance at the end of each month showing cash balance on hand, in agreement with her ledger account.

We have found that the accounts had been carefully kept and that the bookkeeping work on the whole has been good.

Very respectfully,
Harvey S. Chase & Company,
Certified Public Accountants.

AMERICAN PUBLIC HEALTH ASSOCIATION.

Comparative Balance-Sheet.

August 31, 1917 and 1918.

Assets.	*August 31, 1917.*		*August 31, 1918.*	
Cash:				
Treasurer's Account		$146.59		$2,226.46
Secretary's Account		227.10		276.31
Petty Cash		25.00		25.00
Total Cash		$398.69		$2,527.77
Inventory:				
Salable Stock on Hand		150.00		1,836.40
Office Equipment	$1,099.62		$1,186.27	
Less Reserve for Depreciation	109.96	989.66	219.92	966.35
Total Assets		$1,538.35		$5,330.52
Deficit, September 1, 1916	$1,789.99			
Adjustment, Rumford Press Account	54.47			
	$1,844.46			
Deduct Gain, 1916–17	1,737.71	106.75		
		$1,645.10		$5,330.52

Liabilities.	*August 31, 1917.*	*August 31, 1918.*	
Due Rumford Press	$86.04		
Notes, Payable	1,559.06		
Net Profits for Year		$5,437.27	
Less Deficit, 1917		106.75	5,330.52
	$1,654.10		$5,330.52

Note our remarks in the text concerning accounts receivable.

AMERICAN PUBLIC HEALTH ASSOCIATION.

Comparative Statement of Income and Outgo.

For the Years ended August 31, 1915, 1916, 1917, and 1918.

Income.

	1915.	*1916.*	*1917.*	*1918.*
Journal Subscriptions	$4,682.35	$5,104.60	$5,586.73	$2,352.18
Dues, Individual	3,625.00	4,617.53	4,903.04	8,073.57
Corporate and Sustaining Members				4,340.00
Journal Advertising	2,230.44	2,327.53	2,263.83	4,296.73
Sales of Water Reports	782.73	890.10	1,500 65	1,995.28
Sales of Journal Copies	308.87	448.00	327.54	187.70
Sales of Milk and Air Reports	43.45	9.00	144.87	77.65
Sales of Transactions	38.00	11.50		
Sales of Bound Volumes	24.70	46.45	13.38	121.45
Miscellaneous Income	66.04	176.27	99.85	173.49
Sales of Badges		147.00	85.00	48.40
Miscellaneous Sales Account				132.86
Annual Meeting Exhibits				152.50
	$11,801.58	$13,777.98	$14,924.89	$21,951.81

Outgo.

	1915.	*1916.*	*1917.*	*1918.*
Journal Printing and Mailing	$5,185.80	$5,577.81	$6,337.22	$5,593.79
Salaries	3,868.52	2,752.58	2,737.92	1,999.92
Office Payroll	2,034.51	2,442.90	2,450.45	3,578.38
Convention Expenses	1,100.71	338.65	661.73	537.79
Depreciation of Office Furniture and Fixtures			109.96	109.96
Postage	1,063.15	736.74	1,184.92	1,188.40
General Expense	682 39	681.58	732.93	1,049.86
Rent	544.61	626.44	449.98	300.00
Stationery and Supplies	1,346.37	764.63	735.61	605.46
Travelling	190.88	43.90	95.20	274.18
Discounts	84.49	91.25	58.25	24.36
Commissions	68.60	148.45	219.76	179.00
Interest	42.01		31.18	31.36
Refunds	33.71	59.38		
Cost of Pamphlets Sold	170.14	288.28	994.35	1,191.23
Cost of Badges Sold		94.86	64.72	33.60
Annual Meeting Exhibits				61.15
Bank Exchange				10.50
Profit and Loss				5.60
	$16,415.89	$14,647.45	$16,864.18	$16,774.54
Operating Loss	$4,614.31	$869.47	$1,939 29	
Operating Gain				$5,177.27
Add Donations:	1,785.00	900.00	3,677.00	260.00
Net Loss	$2,829.31			
Net Gain		$30.53	$1,737.71	$5,437.27

HELP WANTED.

In order to help relieve the shortage of sanitarians due to the war, free help-wanted announcements will be carried in this column until further notice. Copy goes to the printer on the first of each month. In answering keyed advertisements, please mail replies separately.

The Health Employment Bureau also sends lists of applicants to prospective employers without charge.

State Epidemiologist wanted in West Virginia. Address No. 178, J. L. S., care of this Journal.

Graduate sanitary engineer with experience in operation of rapid sand filter plants. State salary expected. Address No. 176, D. E. S., care of this Journal.

White graduate nurse with public health training for city work. Salary, $1,000 to $1,200 per annum. Send references and experience to Dr. I. M. Cashell, Health Officer, Goldsboro, N. C.

*

National Supervision of Industrial Hygiene and Medicine.—The Office of Industrial Hygiene and Medicine of the U. S. P. H. S. will investigate conditions and institute means whereby lost time and inefficiency caused by impaired health of workers may be cut to a minimum. A large corps of men fitted for industrial service is needed to carry on this work effectively, and the office is seeking the assistance of experienced industrial physicians, hygienists, sanitarians, chemists and technically trained engineers with practical experience in safety work, ventilating, illuminating and production.

The Senate Joint Resolution No. 63, recently passed by Congress, authorizes the granting of commissions in the service of this Division to such men as may qualify. The Division is in urgent need of personnel. Applications for commissions will be received at the office of this Division, Room 202, Ouray Building, Washington, D. C.

*

The following were elected to membership in the Association during October, 1918:

F. A. Anderson, Minneapolis, Minn., Social Service Director, Street Ry. Co.

Benjamin Levin, Pittsburgh, Pa., Bacteriologist.

R. Mitchell Strother, Lynchburg, Va., Employment Manager, Craddock-Terry Co.

W. Lewis Howe, M. D., Everett, Mass., Physician, Chairman Health Dept.

Frank Woodbury Jones, B. S., Albany, N. Y., Assistant Engineer, N. Y. State Health Dept.

Oscar Millson Craven, M. D., Cincinnati, Ohio, Chief Medical Inspector, Dept. of Health.

Ernest Zueblin, M. D., Cincinnati, Ohio, Resident Medical Director.

Edgar L. Vermilya, M. D., Fremont, Ohio.

Robert M. Calfee, Cleveland, Ohio, Member Public Health Council.

Lucy Burton Buell, Painesville, Ohio.

Helena R. Stewart, Ph. B., R. N., State Dept. of Health, Columbus, Ohio., Director Public Health Nursing Service.

John R. Murlin, A. M., Ph. D., D. Sc., Rochester, N. Y., Professor of Psychiology, Director of Dept. of Vital Economics.

Julius Spiro, M. D., Chicago, Ill., Physician.

Martin Schupmann, M. D., Chicago, Ill., Physician, Health Officer.

William P. Schoen, A. M., M. D., Chicago, Ill., Physician.

William J. Pollock, B. S., M. D., Chicago, Ill., Physician and Surgeon.

Alfred L. Buck, M. D., Chicago, Ill., Physician and Surgeon, Food Inspector, Chicago Health Dept.

Hugh James Polkey, M. D., Sc. B., Chicago, Ill., Physician.

Alvah John McCarter, M. D., Chicago, Ill., Physician, Medical Inspector.

Michael J. McKenna, M. D., Chicago, Ill., Physician.

Louis Maywit, Ph.D., M. D., Chicago, Ill., General Practitioner and Field Health Officer, Health Dept.

Jeannette Franc Throckmorton, Ph. B., A. M., M. D., Chariton, Iowa, Physician.

Elizabeth B. Morrill, Ph.G., B. Sc., M. D., Chicago, Ill., Physician and Surgeon.

Morris L. Weinstein, Chicago, Ill., Physician.

Frank H. Stevenson, B. A., M. D., Chicago, Ill., Physician.

Petra M. Dahl, B. S., A. B., M. D., Chicago, Ill., Physician and Surgeon.

Walter Waldo Armstrong, M. D., Chicago, Ill., Supervising Field Health Officer, Chicago.

Milton Frederick Stein, B. S., C. E., Chicago Ill., Sanitary Engineer.

Rosina Rehor Wistein, M. D., Cedar Rapids, Iowa, Physician and Surgeon.

Mayor James Saul, Dubuque, Iowa, Local Board of Health.

Will C. McIrvin, M. D., Atwood, Kans.

Russell J. Smith, M. D., Pocatello, Idaho, Part-Time Health Officer.

George Allen Love, M. D., Preston, Minn., Village and County Health Officer.

Olive E. Beason, R. N., Akron, Ohio, Director Division of Public Health Nursing.

Samuel G. Paul, M. D., Salt Lake City, Utah, Physician, Part-time.

A. M. Harvey, M. D., Chicago, Ill., Physician, Crance Co.

Willard E. Ward, Brookline, Mass., Agent for Milk and Food Sanitation.

W. O. Nance, M. D., Physician, Chicago, Ill.

E. R. Pritchard, Chicago, Ill., Secretary Health Dept.

Charles L. Tinker, M. D., New Philadelphia, Ohio, Health Officer.

W. D. Pennington, M. D., Chicago, Ill., Physician.

Helen Letitia Palliser, A. B., A. M., M. D., Poughkeepsie, N. Y., Physician.

Treston R. Ayars, M. D., St. Louis, Mo., Sanitary Inspector, Camp Custer, Mich.

Leslie E. Coffin, M. D., Iron Mountain, Mich., Physician, Part-time Health Officer.

W. J. Taylor, M. D., Port Angeles, Wash., Part-time Health Officer.

Cecil Kent Drinker, M. D., Boston, Mass., Assistant Professor of Physiology, Harvard Medical School.

Harry R. Cliff, M. D., Portland, Ore., County Physician, Acting A. Surgeon, U. S. Health Bureau.

James P. Faulkner, A. M., Atlanta, Ga., Executive Secretary Ravul Foundation, Director Div. of Tuberculosis State Board of Health.

Ethel R. Hawley, Oklahoma City, Okla., Assistant Registrar of Vital Statistics, Health Dept.

Wm. Harry Cunningham, M. D., Rockford, Ill., Commissioner of Health.

Wm. Albert Mudge, M. D., Negaunee, Mich. Health Officer.

Royal B. Dobbins, M. D., Youngstown, Ohio, Acting Chief Surgeon.

Geo. U. Simpson, M. D., Warren, Ohio, Physician.

Mrs. K. R. J. Edholm, Omaha, Nebr., Executive Secretary, Nebr. Ass'n for the Study and Prevention of Tuberculosis.

Joseph J. Craven, A. B., M. D., C. P. H., Jersey City, N. J., Health Officer.

Geo. Clinton, M. D., D. O. H., Belleville, Ont., District Health Officer.

Walter McNab Miller, M. D., Columbia, Mo., Secretary, Missouri Ass'n for the Relief and Control of Tuberculosis.

Guy E. Shoemaker, Freedom, Pa., Plumbing.

Le Roy Lang, Jacksonville, Fla., Dairy Products Technologist.

John M. Kennedy, Jr., Denver, Colo., Executive Secretary, Colo. Public Health Ass'n.

R. Barclay Spicer, Philadelphia, Pa., Executive Secretary, Penn. Soc. Prev. of Tuberculosis.

George Eaves, D. D., Birmingham, Ala., Secretary Ala. Anti-Tuberculosis League.

David E. Sloan, M. D., Charleroi, Pa., Industrial Physician and Surgeon.

Carrie B. Levy, Milwaukee, Wis., Supervisor, Special Classes School Bd.

Robert B. Kerr, M. D., Manchester, N. H., Physician, Executive Secretary, N. H. Asso'n Prev. of Tuberculosis.

H. M. Bascom, M. D., Peoria, Wis., Chief Surgeon, Ill. Traction System.

Ruth McNary Smith, B. S., Ames, Iowa, Associate Professor Home Economics, Iowa State College.

Charles O. Probst, M. D., Columbus, Ohio.

Francis J. Bean, A. B., Mercersburg, Pa., Instructor in Biology.

William J. Orchard, S. B., New York City, Sanitary Engineer.

Margaret K. Preston, B. S., Utica, N. Y., Bacteriologist.

Morris Dworski, Loomis, N. Y., Laboratory Assistant, Babbit Memorial Laboratory, Loomis Sanatorium.

Isador William Mendelsohn, Worcester, Mass., Assistant Sanitary Engineer.

J. W. Armstrong, Winnipeg, Manitoba, Municipal Commissioner.

Raymond F. Wright, M. D., Chicago, Ill., Physician and Surgeon, Supervising Medical Inspector.

G. M. Cushing, M. D., Chicago, Ill., Sup. Health Officer.

Aaron Grant Fairfax, A. B., M. D., Chicago, Ill., Physician and Surgeon.

Burr A. Robinson, B. S., New Haven, Conn., Industrial Relations Manager Footwear Div., U. S. Rubber Co.

Roy F. Woodbury, Montgomery, Ala., U. S. Public Health Service.

To those members, through whose courtesy these new members were introduced, the American Public Health Association extends its sincerest thanks.

STORIES FROM THE DAY'S WORK

Our readers are invited to contribute to this section.—*Editor.*

A SOLUTION FOR THE "NUISANCE" BUGABOO.

One of the things which most annoys the health officer is the tendency of the public to blame him for conditions over which he has no control. Complaints come in about the streets, sewers, dead animals, plumbing, and other things which are handled by other departments. If the health officer refers the complainant to the proper department, he is accused of incompetence, laziness. "buck-passing" and the like.

Under the new City Manager charter in San José, Cal., this form of annoyance was successfully handled by establishing a central complaint and inquiry bureau in the City Manager's office. Complaints received here were immediately recorded on a special form, and referred to the proper department, and a return report demanded promptly; the return report was then communicated to the complainant, and the matter settled. A notice in regard to the bureau was published frequently in the local papers.

When the Health Department received directly a complaint within its jurisdiction, it was recorded at once on a special form, referred to the proper inspector, and handled promptly. But when a complaint outside its jurisdiction was received, the complainant was referred to the City Manager's complaint bureau; if there was objection, complainant's attention was called to the published notices in regard to the bureau, which usually settled the question. And as the telephone hung up, you could usually hear the department clerk heave a sigh of relief and bless the City Manager form of government.

Harold Gray.

⁂

EMULATING TYPHOID MARY.

An interesting experience with a typhoid carrier was brought to a climax in this state last month.

Early in 1916, several cases of typhoid appeared in the town of S—, population, 12,000. Three cases were found to be securing milk from Mrs. H. B. who kept one cow for family use and sold the residue. Mrs. B. gave no history of having had typhoid fever.

She gave a positive Widal in June, 1916, and was ordered by the local health officer to discontinue the sale of milk. This order was ignored and in a second series of cases, appearing in October, the milk was again traced to this source and an order to discontinue selling milk was issued to this woman by the State Board. Mrs. B. then disposed of her cow. Last Christmas (1917) she bought a new cow and in the spring again began to sell milk occasionally. A family newly arrived in town took milk from this dairy early in the summer. Two cases of typhoid appeared in this family. The State Board of Health filed a complaint and the defendant was found guilty. The sentence of ten days' imprisonment was suspended so long as the defendant refrained from selling milk.

Lester Feezer.

⁂

AN EXPERIENCE WITH ANTHRAX.

Mr. Blank thought his cow looked sick; he noted she was not keen to eat, but before he could do anything the poor thing died. Hides are valuable, why not skin her! Mr. G. was asked to assist; he said "nothing doing," but a young boy on the place was induced to help. In five days Mr. Blank was dead.

While the skinning was in progress, the young fellow who helped was cut on the hand. Soon he became alarmingly ill. The doctor was called and wired the State Board of Health that this was probably a case of human anthrax. The State Board in turn directed the parish health officer to visit the neighborhood and investigate. As soon as he arrived, the parish health officer telegraphed back to the State Office "please send a man to control situation."

A representative from the Louisiana State Board of Health arrived about nine o'clock at night. Nobody wanted to go to the home where the patient was dying or dead; in fact, nobody would go. The doctor learned that one of the physicians of the community was at the home of the dying man and that the neighbors were very greatly excited. Finally the Board of Health physician induced a negro boy to take him "down the road a piece." The directions had been "walk the big road three miles and then go through the woods a half mile." After about ten minutes on the "big road" the boy turned into the woods. "Why, we haven't walked three miles!" "No sah, hits near to two miles and a half in de woods." "Won't you go with me?" "No *sah!*" "Well, won't you go with me until we are about half a mile from the house? I fear I cannot find it." At last the boy was persuaded; but he left the doctor in the woods.

When the physician reached the house he found the poor boy had died and had been buried by his mother and the doctor; no one else would go near.

Members of the families of the patients and some of the neighbors had gathered at the home of one of the patients. Some were praying, some weeping, all hysterical. There were two men sick. One had nursed Mr. Blank, and had been bitten by a mosquito on the arm and had caught the infection from rubbing the mosquito bite with his infected hand. The pustule was typical. The patient developed constitutional symptoms and was very sick.

Another young man, who had nursed the dead boy, had on the back of his hand a sore place, which according to information given, was a pustule also. When this appeared the young man poured carbolic acid over the entire back of his hand. It was a horrible sight, the flesh being literally cooked. Notwithstanding this mistaken heroic treatment, he later developed constitutional symptoms.

Being a practical man, the doctor took off his coat, made himself a cob pipe and sat on the gallery all night, one of the group. He did what was possible to quiet them and wired for serum. Later when the serum arrived, the hardest part of his work was to convince the patients and their relatives that it was not dangerous. Fortunately for the reputation of serum in that locality it worked wonders.

Oscar Dowling, M. D.,
Agnes Morris.

BOOKS AND REPORTS REVIEWED

BOOKS FOR NURSES.

No. I. Hygiene for Nurses. *Nolie Mumey, M. D., Little Rock, Arkansas. The C. V. Mosby Company, St. Louis. Pp.* 160. *Price,* $1.25.

This little elementary book takes up the subject in a way so that the nurse can get ready information without reading voluminous material. The author discusses in simple and clear language eugenics; hygiene of pregnancy, infancy and puberty; the causes and transmission of disease; diseases; immunity; food; water; air; ventilation and disinfection. A total of seventy-one well selected illustrations adds materially to the interest. It may have been well to touch upon the rudiments of vital statistics and to emphasize the importance of personal hygiene which after all is the foundation of preventive medicine.

No. II. A Textbook of Physiology for Nurses. *William Gay Christian, M. D., and Charles C. Haskell, Medical College of Virginia. The C. V. Mosby Company, St. Louis. Pp.* 168. *Price,* $1.75.

The subject is well discussed in thirteen chapters. The illustrations, of which there are thirty-four, were carefully chosen. The writer assumes a certain knowledge of anatomy, physics and chemistry on the part of the nurse. An "Appendix" serves to refresh the memory with some basic elements of physics and chemistry. This little book can be warmly recommended for student nurses. It contains in a brief space as much material as the average nurse would ever require for purposes of study or reference.

No. III. Surgical and War Nursing. *A. H. Barkley, M. D. (Hon.), M. C., F. A. C. S., Lexington, Ky. The C. V. Mosby Company, St. Louis. Pp.* 208. *Price,* $1.75.

This is a timely little book and one that cannot fail to appeal to the nursing profession. Much of the matter discussed deals, of course, with everyday hospital technic but particular stress is laid upon the problems which the nurse is bound to face in connection with wartime activities. Four chapters out of a total of twenty-three are devoted exclusively to "War Nursing." The book is richly illustrated. It represents a practical and valuable contribution to the modern nurse's library.

No. IV. Nursing in Diseases of Children. *Carl G. Leo-Wolf, M. D., University of Buffalo, N. Y. The C. V. Mosby Company, St. Louis. Pp.* 314. *Price,* $2.50.

This book is presented to the profession as a textbook for nurses and all reference to points of diagnosis and treatment have therefore been omitted. Included are chapters on "Public Health Nursing," by Mrs. A. L. Hansen, R. N.; on "The Clothing of the Baby," by M. J. Robertson, R. N.; and on "Mental Hygiene," by H. G. Matzinger, M. D. Even though the book is primarily intended for nurses it contains much which ought to be of value to the medical student who is fed upon theory and to the young physician who very often finds in his early experience with children's diseases that the attending nurse knows more about the practical application of everything pertaining to the comfort of the little patient than he does. The book is written in clear style. The author's wide personal experience on this subject gives it a personal flavor in which respect it differs from many similar publications. The text is accompanied by a goodly number of charts and illustrations.

Arthur Lederer, M. D.

PUBLIC HEALTH NOTES

Abstracted by David Greenberg and M. P. Horowitz.

The Health of Food Handlers.—As a result of a coöperative study conducted by the New York City Health Department, The Metropolitan Life Insurance Company, and The American Museum of Safety, some fairly complete data have been compiled, resulting from 1,980 physical examinations of food handlers. This number represents only a very small fraction of the food handlers that have been examined in New York City since August, 1915, when a new provision in the Sanitary Code made it compulsory for every food handler to obtain a certificate of health from the Health Department. The cases represented in the study are those for which fairly complete information had been obtained.

Of the 1,980 persons examined, 1,590 were males and 390 were females; 80.2 per cent were in the age period between 20 to 44 years; 81.0 per cent were restaurant and hotel workers; and 16.0 per cent were bakers and confectioners. Of the 81.0 per cent, 44.2 per cent were waiters and waitresses, 19.6 per cent were cooks, and 9.1 per cent were dishwashers and kitchen employees. The examination in these cases was very thorough. It was found that 32.1 per cent of the males and 13.3 per cent of the females were free from any condition or disease worthy of attention. It should be borne in mind that all of these cases were apparently well and that each individual was actually engaged in work at the time of examination. Among the diseases and defects that were found, the following may be mentioned: 10 cases of active tuberculosis, 3 arrested cases and 12 suspected cases; 19 cases of active syphilis and 32 cases of suspected syphilis; 6 cases of gonorrhoea. Determinations for the prevalence of this disease among women could not be made; 370 cases of anemia; 112 cases showing eye diseases; 124 cases of organic diseases of the heart; 64 cases of diseases of the arteries; 237 cases of varicose veins; 110 cases of colds and rhinitis; 25 cases of chronic bronchitis; 104 cases of pulmonary emphysema; 208 cases of pyorrhea alveolaris; 288 cases of dental caries; 202 cases of pharyngitis; 62 cases of hernia, and 133 cases of flatfoot. Bakers and cooks particularly seem to suffer from cardiovascular disease, anemia, flatfoot and respiratory disorders. (*M. P. H.*)

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Supervision of the Feebleminded.—Segregation, much more than sterilization, offers a practical solution to part of our problem at least and may eventually be the final, most practical solution. The best plan for supplementing segregation and sterilization for the present, the only way to obtain the kind of information we need and must have about the feebleminded, the best scheme for educating the people to a comprehension of the problem and a willingness to accept segregation and sterilization when necessary, is the plan for careful scientific supervision of the feebleminded in the community as part of a state or nation-wide program for control and prevention of feeblemindedness.

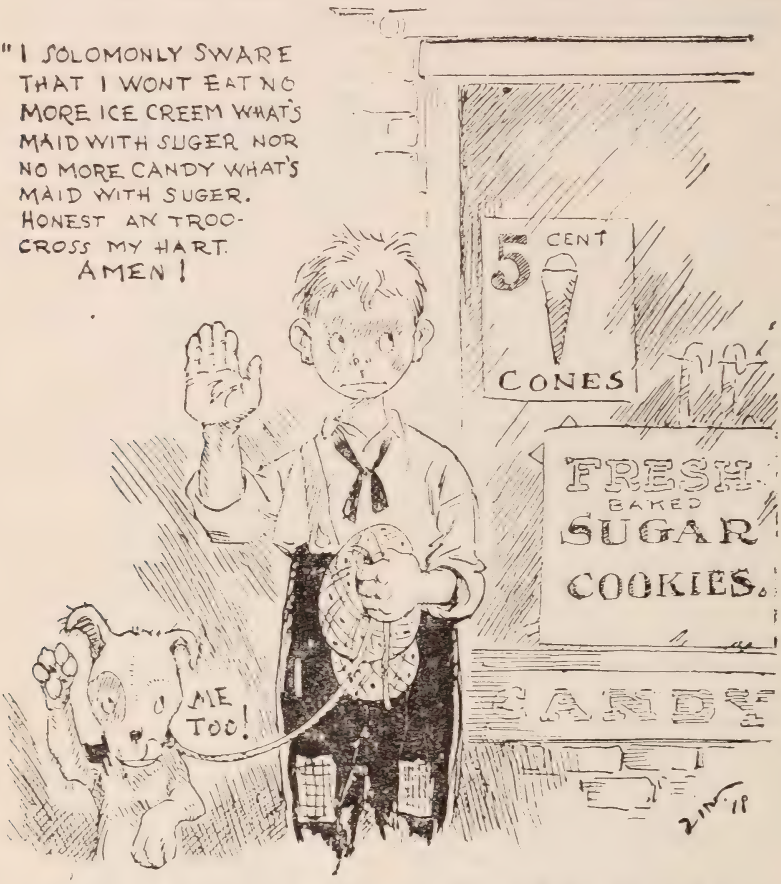
The school and the ungraded class give us the nucleus for a system of supervision which could be worked in so simply that it would not only not meet with opposition, but would be welcomed by the children and by the parents. In order to make such system of after-care effective in a school system, three things are essential: (1) an adequate mental clinic under the direction of a psychiatrist with psychological training or of a psychologist with psychiatric viewpoint and experience, (2) social service from the time the feebleminded child enters the special class, and (3) a vocational and employment bureau which shall be merely another phase of the mental clinic and the social service. This last essential will help to utilize the labor represented by the feebleminded population.

As to expense, it is merely a question of whether we shall pay blindly or consciously, whether we shall pay in crime, in courts, in reformatories, in prisons, in almshouses, or whether we shall pay in directed care calculated to give us the facts which may in time make control and prevention of feeblemindedness possible.—Taft, Jessie, *Mental Hygiene*, July, 1918, p. 434. (*D. G.*)

⁂

Health Education Conducted by the Office of the Chief Surgeon, A. E. F.—A series of weekly bulletins is being issued by the Office of the Chief Surgeon, American Expeditionary Forces, which is circulated among the medical officers. It is the only educational matter which is being prepared by the Chief Surgeon's Office, and aims to bring to the attention of the medical officers, not only new ideas and suggestions, but to acquaint them with the extent and nature of the prevalence of disease, the best means of combating specific diseases, and the work which is being carried on throughout America's large army which is now in France. Major Haven Emerson, formerly health commissioner of the City of New York, is in charge of the work.

It is stated that the "death-rate in the American Expeditionary Forces from causes other than "in action" is twice as high as that experienced in civilian life among the same age group in males, and twice that recorded in the Regular United States Army during peace times." This is due apparently to overcrowding, personal uncleanliness and the prevalent habit of promiscuous spitting in and about sleeping quarters and mess. The following diseases seem to be the essential causes of the deaths: pneumonia, diphtheria, meningitis, typhoid fever, scarlet fever, syphilis, tuberculosis, mumps, measles and anthrax. In the case of pneumonia, the incidence has been 4 to 12 times as great as for the United States Army in peace times. The death-rates for this disease have been from 10 to 30 times as high as normally in the army, and from 8 to 25 times as high as in the civilian population of males from 20 to 34 years of age, in the United States.


"I SOLOMONLY SWARE THAT I WONT EAT NO MORE ICE CREEM WHAT'S MAID WITH SUGER NOR NO MORE CANDY WHAT'S MAID WITH SUGER. HONEST AN TROO- CROSS MY HART. AMEN!
5 CENT CONES
FRESH BAKED SUGAR COOKIES.
ANDY
ME TOO!

AN HEROIC SACRIFICE.

The epidemic of influenza is discussed, but the Pfeiffer's bacillus is not held as the cause. Warning is sounded against the spread of malaria in France due to the presence of numerous malarial victims from the southern states of the Union. The anopheles mosquito has been found in France too. Another warning against the spread of trachoma to the American troops from the Chinese coolies is also sounded. Attention is also directed against the destruction of lice, the protection of water supplies, the destruction of feces and urine, the treatment of cases of gas poisoning, the treatment and precautions directed against syphilis, and other matters of extreme importance in caring for the health of the American soldier in France. (*M. P. H.*)

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Army Rejection Statistics.—The author, speaking of pre-war army rejection statistics, says "the rejection statistics of the United States Army are quite difficult of correct interpretation and emphasize the urgency of extreme care in the use of army recruiting data for other than military purposes. The term rejection in army recruiting has apparently quite a different significance from what it has in life insurance practice or in the physical examination of applicants for official positions."

In the period 1913–1915, out of 461,033 applicants examined for service, 75.9 per cent were declined. "Many applicants were declined in all probability, for defects or deficiencies, physical, mental or moral, each without a very decided bearing upon the question of physical strength and power of endurance."

Conclusions frequently advanced to the effect that the physique of any given country has improved or deteriorated on the basis of recruiting statistics are decidedly misleading and every authority in military statistics rejects unconditionally the assumption that the data can be used for the purpose of ascertaining physical progress or decay.

Under the Selective Service Regulations a total of 730,756 men were rejected from 2,510,706 examined, and with a correction applied for those men who were rejected at Camp, it appears that 35 per cent of the men physically examined by the boards were considered totally unfit for active military service.

The only analysis of the causes of physical rejection which has thus far been made by the Provost-Marshal General's Office concerns 10,258 of the above group of recruits rejected. The author is of the opinion that the rejection statistics of this group fail in every way to sustain the conclusion so frequently advanced by sensational writers that the medical examinations under the first Selective Draft have brought to light a truly astonishing amount of physical impairment and military inefficiency on the part of the men of the draft age period—21 to 30 years inclusive.—Hoffman, F. L., *Army Anthropometry and Medical Rejection Statistics*, Prudential Insurance Co., 1918. (*D. G.*).

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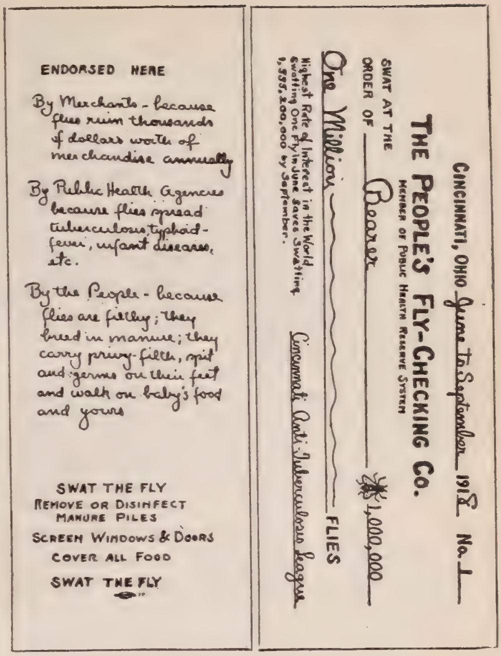
Sanitation of Rural Workmen's Areas.—This report of the Committee on Welfare Work of the Committee on Labor, Council of National Defense, contains much valuable and practical information and should be of great help to executives in welfare work and others interested in housing. Details as to the selection of new villages and camp sites, the preparation of the site, the provision of a safe water supply, methods for the collection and disposal of excreta, garbage and other refuse, are carefully outlined. In addition plans for the construction of temporary and permanent houses for industrial villages, and the standards of ventilation, drainage and plumbing in connection with these structures are considered.—*Public Health Reports*, September 6, 1918, p. 1477. (*D. G.*)



CINCINNATI, OHIO June to September 1918 No. 1

THE PEOPLE'S FLY-CHECKING CO.

MEMBER OF PUBLIC HEALTH RESERVE SYSTEM

SWAT AT THE ORDER OF Bearer 1,000,000

One Million FLIES

Highest Rate of Interest in the World
Swatting One Fly in June Saves Swatting
1,555,200,000 by September.

Cincinnati Anti-Tuberculosis League

ENDORSED HERE

By Merchants - because flies ruin thousands of dollars worth of merchandise annually

By Public Health Agencies because flies spread tuberculosis, typhoid-fever, infant diseases, etc.

By the People - because flies are filthy; they breed in manure; they carry privy-filth, spit and germs on their feet and walk on baby's food and yours

SWAT THE FLY
REMOVE OR DISINFECT MANURE PILES
SCREEN WINDOWS & DOORS
COVER ALL FOOD
SWAT THE FLY

Fly Checking in Cincinnati.—The Cincinnati Anti-Tuberculosis League has recently got out the clever piece of publicity shown by the accompanying illustration. "On Saturday, June 8," the Secretary of the League writes, "Boy scouts distributed 15,000 copies of the check at the important street corners in the city. Several manufacturing concerns placed checks in their employees' pay envelopes. Altogether it was a very successful campaign, several people returning to ask the Boy Scouts for additional checks. As far as I can determine, not one of them was thrown into the street. Because of their resemblance to real checks many persons used them for playing jokes upon their friends and thus the information about the fly was spread still further."

*

Vital Statistics in Framingham.—The third of the series of monographs issued by the Framingham Community Health Demonstration has just appeared and deals with the vital statistics of the community. The analysis is very complete; the study covering the ten-year period from 1907 to 1916. The city was divided into precincts, and the statistics were analyzed for each precinct individually, and for the city as a whole. This was done in studying the population, causes of death, death-rates, birth-rates, infant mortality rates, age distribution, and race distribution. The death-rate was calculated not only for the total deaths occurring, but also for the total deaths minus the non-resident deaths, and also for the corrected number of resident deaths, when the records of residents dying out of town could be obtained. Standardized death-rates were also worked out, using the population of Sweden in 1890 as the basis. Causes of death were investigated and corrected, wherever any doubt of the primary cause existed. A special investigation was also made in the case of deaths reported as due to bronchitis in order to ascertain how many of these deaths were really due to tuberculosis. It was found that about 22 per cent might be added to the registered tuberculosis mortality as a result of this investigation.

The results show that Framingham has been growing rapidly during the past five years, and that the increase is to a large degree among the foreign born, particularly among the age groups under forty. The average yearly death-rate for the period under consideration was 15.30 per 1,000 population. The death-rate for residents only was 12.56 and the rate for the corrected resident deaths was 13.65. The main causes of death are organic heart disease, Bright's disease, cerebral hemorrhage, pneumonia, cancer, and tuberculosis in the order named. Tuberculosis and infant mortality are perhaps the most likely preventable diseases. The tuberculosis death-rate among Italians was low, whereas that among the Irish and Irish-Americans was high. The reporting of the disease is considered very poor. The same is true regarding the reporting of births. It was found that in 1916—the only year for which the birth records are accurate—that the birth-rate among the foreign born was twice that among the native born, whereas the infant mortality rates varied only slightly, in comparison. The birth-rate for the entire city in 1916 was 25.3 and the infant mortality rate for the same year was 84.0. The infant mortality rate was found to be higher in the less prosperous districts.

The authors of Framingham Monograph No. 3 are Dr. Donald B. Armstrong and Franz Schneider, Jr. (*M. P. H.*)

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No Specific Cure for Influenza Yet Known.—The United States Public Health Service is besieged with inquiries as to the value in combating or treating "Spanish" influenza. Public interest in this form of treatment appears to have been aroused by newspaper accounts of the trials now being made of vaccines in various parts of the country. So far as the Public Health Service is able to learn, the use of none of these vaccines has gone beyond the experimental stage. In fact those most conversant with the subject hesitate to give any encouragement to the public lest there subsequently come a sad awakening.

"It must be remembered," said Surgeon-General Blue, "that several different vaccines are now being tried. In and around Boston considerable use is being made of Leary's influenza bacillus vaccine; in New York a vaccine made from various strains of influenza bacilli is being tested under the direction of Park, while in Chicago an entirely different type of vaccine, prepared by Rosenow is being tested. This consists of a mixture of pneumococci, streptococci, staphylococci, and influenza bacilli. The reports so far received do not permit any conclusion whatsoever regarding the efficacy of these vaccines or their relative merits. The Public Health Service is watching the experiments carefully, but is not urging any form of vaccine treatment at the present time."

The present epidemic has given rise to the publication of numerous "sure cures" and methods more or less plausible to the lay mind. The advocates of some of these have addressed long communications to Secretary McAdoo, to Surgeon-General Blue, to the War Department or other government agencies; hundreds of them have written to editors of newspapers. In general the suggestions fall into several groups.

First comes the individual who has a specific remedy, the formula of which he is ready to give to the world for a price. One such writer reminds the Surgeon-General of the million dollars that Congress has appropriated for combating influenza, and offers to sell his secret for "a reasonable sum."

Next comes the person with the pseudo-scientific treatment, sometimes "isotonic sea-water," sometimes "ozono therapy," and again "harmonic vibrations." One such writer, well known to the New York health authorities, addressed the Surgeon-General from his present residence, the State Hospital for the Insane.

Still another type is the individual who gives freely of his advice so that humanity may be spared from the pestilence. Such a one writes "sprinkle a little sulphur in each shoe every morning"; this was given to the people of Atlanta by a doctor of forty odd years of practice. He also used it when waiting on yellow fever years ago. A mother advises people to add "ten cents worth of asafetida to half a pint of brandy, and give a teaspoonful every two or three hours. I gave my baby one-fourth teaspoonful with good results."

One writer who says he lives "at the jumping-off place in western California," has perfected a patent medicine which will "knock out germs and remove the real cause of sickness. I got it by combining powerful essencial oils that will penetrate the hardest wood that grows the compound while it is not a poison it will penetrate any and all kinds of germs or insects and dry or burn it up in a minute." This wonderful xxxxx (name deleted by censor) sells for $1.00 per bottle.

One writer frankly advises the use of a patent medicine formerly widely advertised as a cure for consumption, but now compelled by the government to be labelled simply a remedy for coughs and colds.

A physician writing from Missouri offers "to furnish his remedy for the nominal price of $4.50 for each patient, or will take a Surgeon-Major's commission and pay," and give his services to the Army Medical Department. He has tested his remedy "on the most Desperate caises."

A patriot advises the use of a patent medicine made in Detroit. Used in a case recently, it was observed "that within thirty minutes after applying the medicine the patient was relieved of all pain in the lungs and immediately was well and about."

From Portsmouth, Va., comes a letter which calls attention to the real cause of the epidemic, namely "Descreation of God's Sabbath which He said Keep Holy." Then following a number of quotations from the Bible to support the writer's contention that the epidemic was sent by the Almighty to punish the world for its sinfulness.

Comes also the mental scientist who regards the epidemic as engendered entirely by fear. "This sort of infectious suggestion is a crime against the public, is treason to our government, and the traitors responsible for it shall not be allowed to go unpunished."

Recalling the statement that the epidemic had probably originated in the Orient, one writer advises an examination of all pepper and tobacco throughout the country. She neglects to say what to look for in such examinations.

The food faddist is not missing from those who have sure cures. One advises the elimination of white bread, rice, coffee and tea, and the use of spring water and molasses in place of sugar.

The prescription for alcohol and chloroform to be inhaled from cotton comes from several sources, with slight variations. This is true also of the receipt for hot lemonade without sugar.

The wearing of amulets is also advocated. One writer prefers asafetida tied in a piece of gauze and worn by a string around the neck. Another recommends camphor used in the same way; still another uses a secret compound which he desires to patent. For a receipt consisting of water, salt and coal oil, and called "a sure cure for influenza," a woman writing from Missouri, states that she will be thankful for the reward which she understands has been offered by the government.

The list might be continued, but the suggestions are largely variations and repetitions of what has already been cited.

The United States Public Health Service urges the public to remember that there is as yet no specific cure for influenza, and that many of the alleged "cures" and remedies now being recommended by neighbors, nostrum vendors and others do more harm than good. The chief reliance must be on fresh air, nutritious food, plenty of water, cheerful surroundings and good nursing. If any specific like a vaccine or serum is found to have value, the Public Health Service will give the matter wide publicity.—*U. S. P. H. S. Press Announcement.*

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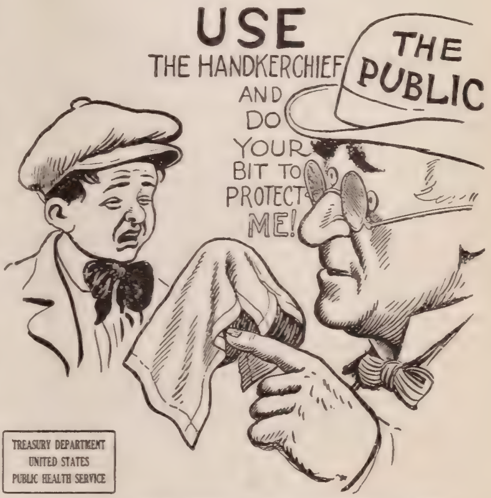
Government Bulletins and Posters on Influenza.—Under authority of the million dollar appropriation made by Congress for combating influenza and other communicable diseases, the United States Public Health Service has prepared and distributed nearly six million copies of a popular leaflet on "Spanish" influenza, and thousands of posters warning against the dangers of spray infection. Practically all of this material has been distributed through state health officers; some of the posters also through federal channels to post-offices and railroad stations. Because of the more forceful appeal made by pictures, the Public Health Service has issued a striking poster by Berryman, the well-known cartoonist of the Washington *Evening Star*. A supply of these posters has been sent to state health officers throughout the country. A limited number will also be sent to local health offices on request to the United States Public Health Service, Washington, D. C.


USE THE HANDKERCHIEF AND DO YOUR BIT TO PROTECT ME!
THE PUBLIC
TREASURY DEPARTMENT UNITED STATES PUBLIC HEALTH SERVICE

COLDS, INFLUENZA, PNEUMONIA, AND TUBERCULOSIS ARE SPREAD THIS WAY

Educational material dealing with influenza and other communicable diseases has been supplied to school teachers throughout the country, with the request that they use this in class room instruction.

While the ravages of the present epidemic have been undoubtedly very great, it is not unreasonable to hope and believe that the educational measures which it has called forth will result in an appreciable reduction in the prevalence of respiratory infections generally because of the wider observance of precautions by the public.—Rupert Blue, Surgeon-General, U. S. P. H. S.

⁂

United States Public Health Service and Influenza.—With the widespread occurrence of influenza, urgent calls for medical and nursing assistance were directed to the Public Health Service. The regular officers were thereupon assigned to the stricken communities, and the Red Cross, the Volunteer Medical Service Corps and the nursing and medical professions generally were called upon. The V. M. S. C. furnished a list of 1,000 physicians, but the nursing problem was more difficult, and it was necessary to call upon many volunteer untrained nurses.

Congress promptly passed the Weeks bill, appropriating $1,000,000 to fight the epidemic.

For service in communities where the disease is still prevalent, physicians are asked to report to the U. S. P. H. S. Officer in Charge, care of the State Board of Health. Nurses are requested to address the local Red Cross Chapter.

The Public Health Service points to the inadequacy of the present system as indicating the need of a Public Health Reserve.*—*Public Health Reports.*

⁂

Gorgas and Ireland Return.—The press announces the return from France of Major-General W. C. Gorgas, M. C., and of Major-General M. W. Ireland, M. C., who succeeds Gorgas as Surgeon-General of the Army. Secretary Baker has announced the recall of Gorgas to active service from which he was automatically retired by age very recently.

⁂

Credit to Boston Herald.—The JOURNAL wishes to give due credit to the *Boston Herald*, from which with slight additions, the chart of mortalities was taken, which was shown in our last issue. The original chart was drawn by James O. Jordan, of the Boston Health Department.

Standard Maternity Records.—The American Association for Study and Prevention of Infant Mortality has issued standard records for use in prenatal and postnatal care. It is desired to give these the widest possible use and health departments are therefore invited to send for specimens to the Association at 1211 Cathedral St., Baltimore, Md.

The prenatal record takes in the preliminary history of the expectant mother, previous pregnancies, history of present pregnancy, medical examination, economic condition of family, history of labor, of puerperium, of child, a summary at end of year, and main directions of prenatal care.

The postnatal record includes the family history, income, housing and sanitation, record of children, baby's history, feeding history, physical examinations, spaces for detailed notes of physician and nurse, and a summary for the year.

⁂

Focal Infections of the Mouth.—Focal infection of the mouth (chronic alveolar abscess, chronic pericementitis, acute and chronic infection of tonsils and other oral, nasal and aural cavities adjacent) produce serious, grievous and dangerous diseases of the heart,—endocarditis, myocarditis, pericarditis, pancarditis. Often unrecognized because of its slow, insidious progress, grave maladies of the heart are produced secondary to gross, filthy, offensive, disease of the mouth. The laity must be instructed that the care of the human mouth (and accessory cavities) from focal infection or the early eradication of oral infection when present, is an insurance against the occurrence of many dreadful systemic maladies.—Brown, A. G., *Southern Med. Jour.*, September, 1918, p. 601. (*D. G.*)

⁂

Anti-Tuberculosis Work in Oklahoma.—The Oklahoma Association for the Prevention of Tuberculosis held its first annual meeting on September 24, 1918, in Oklahoma City. The meeting was a public health conference held in coöperation with the State Department of Health of which Dr. John W. Duke is commissioner. Over two hundred people from all over the state attended.

During the past year the Tuberculosis Association has been very active in combating tuberculosis throughout the state. To this end, ten public health nurses were appointed in different communities; two tuberculosis dispensaries were established in Oklahoma City and Muskogee; a school for public health nurses was conducted by the association during the summer; and complete health surveys were conducted in the five largest cities of the state. The surveys were undertaken not only to aid in combating tuberculosis, but to ascertain exactly what the health conditions in these communities were, and to stimulate each community to better health protection and prevention of disease. In addition an extensive educational campaign was carried on, aided by lantern slides, exhibits, printed materials and a lecture service. The lantern slides and exhibits are original and striking and are said to represent some of the best material along these lines in the country. A campaign is being waged at present for open-air schools and the recognition of incipient cases of disease among children. The association has just published a very attractive pamphlet dealing with the normal diseases of childhood. These are being distributed throughout the state to the teachers in the schools.

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*Senate Joint Resolution 63, authorizing the establishment of a Public Health Reserve, has been passed by Congress according to a subsequent statement.

For the coming year, the plan is to increase the nursing and dispensary facilities, to care for the discharged tuberculous soldiers, and to obtain legislation for the establishment of state and county sanatoria for the tuberculous.

The secretary of the association is Jules Schevitz. Requests for literature and other information may be addressed to the association at 315 Oklahoma Building, Oklahoma City, Okla. (*M. P. H.*)

⁂

North Dakota University Departmental Bulletins.—The North Dakota University has issued 27 brief bulletins, through its public health laboratories, which deal with daily public health problems. Some of the topics considered are: pure water and how to obtain it; the production and care of milk for infant feeding; colds; cerebrospinal meningitis; scarlet fever; disinfection and disinfectants; the teacher and communicable disease; diphtheria; typhoid fever; measles and whooping-cough; fresh air and why; the sanitary privy; rural sanitation. In each case the important principles in connection with the subject are considered. The aim of the bulletins is strictly educational.

(*M. P. H.*)

⁂

Women Workers and the Health of the Nation.—From extensive experience in connection with the health of women in industry, Miss A. M. Anderson, the principal lady inspector of factories in England, concludes that although there has been much fatigue and preventable strain, there is apparently no indication at present, that the health of women has suffered because of their increased industrial efforts due to the war. This is probably due to the extra care that has been taken to safeguard their health and to the improved earnings and dietaries of the workers. It is important too that girls who are either too young or physically unable for a job should not be employed. Nor should the mother be permitted to return to her work immediately after childbirth. Work which required serious overstrain was wisely delegated to the men—*The Journal of State Medicine*, September, 1918, London, England. (*M. P. H.*)

⁂

STATE HEALTH NOTES.

Maine.—The epidemic of influenza has been prevalent throughout Maine during the last few weeks. The following places report the largest number of cases: Portland, Bath, Eastport, Lubec and Lisbon Falls. The State Department of Health has been instrumental in obtaining the coöperation of the United States Public Health Service in the detailing of United States Public Health Service for organizing the campaigns against influenza in Bath, Lisbon Falls and Eastport. Epidemic influenza was made a reportable disease by the Public Health Council on September 4, 1918, and in addition to this has been placed on the list of diseases requiring modified quarantine.

On September 4, 1918, the Public Health Council of the state of Maine adopted rules and regulations for the control of venereal diseases, which were later approved by the governor and his council. These rules and regulations declare venereal diseases to be dangerous to the public health, and to be reportable and quarantineable under certain conditions, based upon the recommendations of the United States Public Health Service.

An excellent start was made during the past summer in a state-wide inspection of hotels by the State Department of Health, based on rules and regulations previously adopted.

Surveys of Public Health Administration in Portland and Lewiston have been made during the past year by A. P. Pratt, C. P. H., under the direction of the State Department of Health. The former survey was published in the monthly bulletin of the Department for March, 1918. The report of the Lewiston Survey will appear in a coming bulletin.

Governor Milliken has appointed the following coöperating emergency health committee to combat influenza in the state: Chairman, Dr. L. D. Bristol, state commissioner of health; Dr. W. A. Kempf, representing the United States Public Health Service; Mr. L. E. Smith, Jr., representing the Red Cross; and Mr. Harold Sewall, representing the State Public Safety Committee. Through the coöperative efforts of this committee, it is hoped that the epidemic of influenza may be checked more promptly than through the individual efforts of the various agencies concerned.

(*L. D. Bristol, M. D.*)

Massachusetts.—The Massachusetts State Department of Health announces the following appointments: Dr. J. J. Carroll of Holyoke, acting assistant surgeon, United States Public Health Service, to be chief of the subdivision of venereal diseases, State Department of Health of Massachusetts. Lieutenant Carroll succeeds Major Alec Nicol Thomson who is now in charge of the work of correlating the efforts directed against venereal disease in the New England states in behalf both of the Army and of the United States Public Health Service; Dr. Lily Owen Burbank of East Bridgewater to be directer of educational work for women, of the subdivision of venereal diseases.

(*M. E. Champion, M. D.*)

◆

New York State.—The total number of reported influenza cases in New York state from October 2, when the first signs of an epidemic became manifest, to November 1, was 114,486.

Since the epidemic started, the state has had supervision over 122 nurses and 38 physicians engaged in fighting the disease throughout the state. The services of 92 of the nurses and 4 of the physicians were obtained under the special appropriation of $50,000 made available by Governor Whitman for emergency medical and nursing service.

One hundred and three communities in the state have been furnished nursing assistance. Of this number only fifty-five are today considered as under actual epidemic conditions. Thirty-four have been freed to the extent that they are now able to cope with the situation without further state aid.

◆

Public Health Nurses in New York State.—According to the records of Miss Ysabella Waters, of the National Association of Public Health Nurses, there were on September 1 a total of 1,805 public health nurses in New York State. Of these 1,084 are located in New York City, 121 in Brooklyn, which leaves a total of only 600 nurses engaged in the various branches of public health work in the rest of the state. Later statistics compiled by the New York State Department of Health places the number of up-state nurses as approximately 700.

◆

Major Berry Made Lieutenant-Colonel.—Information has recently been received that Major Berry, formerly sanitary supervisor, and later epidemiologist in the New York State Department of Health has recently been promoted to Lieutenant-Colonel.

At the battle of Wytschaete Ridge Major Berry outlined a special plan of campaign which received the approval of the Major-General and which resulted in his command achieving its particular objectives in quicker time than any other unit, and with fewer casualties. The regiment and Major Berry won the commendation of the entire division.

(*Albany Journal*, October 16.)

◆

Staff of Bureau of Venereal Diseases.—Permanent appointments to the staff of the Bureau of Venereal Diseases of the New York State Department of Health have recently been made, as follows: Joseph S. Lawrence, M. D., chief; Edward H. Marsh, M. D., consultant; Walter S. Goodale, M. D., hospital and dispensary inspector and organizer; F. S. Honsinger, M. D., lecturer on social diseases; Maud Casey, supervising nurse and social worker.

◆

Death of Miss Cunningham, Supervising Nurse.—Miss Hannah M. Cunningham, one of the supervising nurses of the New York State Department of Health, died at Ithaca, October 23, of bronchopneumonia following influenza.

Miss Cunningham was formerly school nurse in the Troy public schools. She became connected with the New York State Department of Health in April, 1918, and did effective work as nurse in the after-care of poliomyelitis. Later she was assigned to assist newly appointed municipal public health nurses. When the influenza epidemic started, Miss Cunningham was detailed to the Emergency Hospital at the Camp of the Students' Training Corps at Cornell University.

Miss Cunningham was a graduate of the public health nurses' training schools of New York, Boston and Syracuse and was regarded as one of the best qualified nurses in the department.

(*B. R. Rickards.*)

◆

New York City.—The epidemic of influenza continues with unabated severity, though for the past week the cases have shown a less number. The deaths have been more frequent. Sanitary Code, Article 12, was revised, relative to the heating of occupied premises, requiring landlords to furnish tenants who have contractural relations regarding heat, maintaining a minimum temperature of 68°.

Hospital clearing bureau, for the purpose of handling cases concerning admission of patients, distribution of patients, securing physicians and aiding in obtaining nurses and nurses aids.

Established clinics for advice to those who could not secure medical attention and for the administration of immunizing vaccine, produced by the research laboratory of this department.

Exhibits prepared relative to the use of masks, also instruction relative to the making of masks.

A crêpe paper mask, 13 x 4 inches with a hole at each end 1 inch x 2 inches, making loops for the ears, being specially advised on account of its efficiency and inexpensiveness.

A motion-picture film was prepared for the news weekly, exhibiting the preparation and use of mask, advising the public to protect themselves in this manner. (*S. Dana Hubbard, M. D.*)

⁂

Ohio.—Dr. R. P. Albaugh, director of the division of industrial hygiene of the State Department of Health, has been granted a leave of absence to take up work with the United States Public Health Service as director of an industrial hygiene field unit. The state industrial hygiene work is in temporary charge of Dr. E. R. Hayhurst, former director of the division and more recently consultant to the division.

Miss Sara A. Kerr, statistician in the State Department of Health, has sailed for France for duty with the American Red Cross. She is on leave of absence from her state position.

Dr. E. W. Scott, of the United States Public Health Service, was assigned to duty in the State Department of Health during the influenza epidemic as director of the field work of the Service in the state. He was in charge of a force of fifty physicians employed by the Service for work in the most serious local outbreaks. The Red Cross Lake Division established an emergency relief bureau in the department, under Stockton Raymond, to handle calls for nurses and supplies.

With the appearance of the influenza epidemic in Ohio, the State Department of Health adopted a set of instructions to local health officials, directing them to close theaters, schools, churches and other places of public assemblage when influenza appeared in their respective communities. They were also instructed to forbid loitering or congregating in saloons, poolrooms and other places. Influenza was made a reportable disease by these regulations.

As the epidemic spread rapidly over the state, "closing orders" were soon put into effect by local health authorities in practically all parts of Ohio. These various local regulations differed greatly in detail, but in general the principle followed was to stop all unnecessary gatherings, especially indoor public meetings.

Influenza first appeared in Ohio at Camp Sherman, the army cantonment at Chillicothe. This outbreak was followed by several in widely scattered communities, all of which were traced, more or less definitely, to Camp Sherman, Great Lakes Naval Station and Fort Sheridan. After these beginning outbreaks, the spread of the disease to other localities was rapid. Especially severe attacks were experienced in several mining districts where living conditions facilitated the rapid spread of the disease and increased the fatality rate.

The State Department of Health distributed 325,000 educational circulars, giving instructions for the prevention of influenza and the care of sufferers.

The danger in depending upon disinfection to make an impure water supply safe for public use was illustrated recently by a typhoid outbreak of forty-four cases at Xenia, Ohio. Epidemiological investigation and analysis of city water samples proved the water to be the source of infection. After further study it was found that the bleaching powder used in disinfection was of only one-fifth its guaranteed strength. The superintendent of the disinfection plant, who was not a chemist, had failed to detect this weakness and had been using the powder in the same quantities as required for full-strength chemicals. The State Department of Health recommended abandonment of the unsafe source of supply at as early a date as possible and the substitution, in the mean time, of disinfection by liquid chlorine for the bleaching-powder treatment. (*Vinton E. McVicker.*)

⁂

Wisconsin Public Health Notes.—Dr. B. L. Schuster, diagnostician at the State Board of Health laboratory at Albany, N. Y., and formerly connected with the United States Public Health Service, has been appointed full-time health officer and director of the state coöperative laboratory at Wausau, Wis.

Dr. W. W. Stebbins has been appointed medical supervisor of the Madison public schools.

Dr. W. S. Lincoln, a former health officer of Dodgeville, Wis., died from influenza in October.

Miss Elizabeth Casey, formerly superintendent of the Trinity Hospital Nurses' Training School, Milwaukee, has assumed charge of the training school at Mercy Hospital, Oshkosh.

The new rules of the Wisconsin State Board of Health for the prevention and control of venereal diseases have been officially promulgated and have the force of law.

Dr. W. D. Stovall, director of the Wisconsin State Laboratory of Hygiene, has been assigned by Surgeon-General Rupert Blue to direct the work of venereal disease control for the state of Wisconsin.

Dr. I. F. Thompson, Eau Claire, Wis., deputy state health officer for the western and northwestern Wisconsin territory, has resigned to join the service, and has gone to Fort Oglethorpe, Georgia. Dr. Thompson has received a captain's commission and been assigned to the epidemiological division of the medical service.

Influenza was widely prevalent throughout Wisconsin in October, and the entire medical and nursing resources of the state were taxed to the utmost to combat it. An order by the State Board of Health on October 10 instructed local health authorities to close all schools, churches, Sunday schools, theatres, moving picture houses, other places of amusement, and all public meetings. This was supplemented on October 25 by an order to continue unrelaxed the restrictions upon all public assemblages. The southern section of the state was first affected and the disease raged for several weeks before signs of diminution appeared, and then spread into the northern counties. In some places every physician was down with the disease and a large part of the population were ill. The State Board of Health assisted in supplying such towns with medical aid wherever possible. The closing order was placed in effect in all communities, and the utmost coöperation was given by municipal authorities and the public in making the order's enforcement fully effective. In a number of cities teachers whose work was suspended by the closing order responded to calls for emergency nursing, and gave devoted and intelligent service for weeks in caring for influenza-pneumonia cases under the directions of the physicians. Their spirit in this emergency was one of the splendid by-products of the fearful scourge which ran its course in so many communities.

PUBLIC HEALTH LABORATORY NOTES

Abstracted by Arthur Lederer, M. D.

Adsorptive Disinfection by Metallic Combination.—Finely divided wood charcoal, Fuller's earth, silicic acid, animal charcoal, iron oxide, alumina, calcium oxalate and barium sulfate all act as disinfectants toward staphylococcus due to their adsorptive properties. The bacteria are retained living on the surface of the adsorption medium. The amount of adsorption varies from 99.97 per cent with wood charcoal to 66.32 per cent with alumina. The deposition of thin films of metals on the adsorption medium has the effect of killing the adsorbed bacteria, the action of the metal being specific. A mixture of two metals is still more effective in certain cases. On injecting colloidal metals into mice, mixtures of metals were found to be more deadly than the single metals.—H. Bechhold, *Z. Elektrochem.*, 24, 147 (1918); *Jour. Soc. Chem. Ind.*, 37, 528a (1918).

⁂

Ammonia Determination in Urine, Serum Etc.—Ten cc. of the sample is mixed with 40 cc. of water and distilled at 50 C. under 5 to 10 mm. pressure with addition of 10 cc. of 10 per cent sodium carbonate solution; the distillate is collected in a definite quantity of standardized sulfuric acid. The distillation of the ammonia is complete in about 45 minutes. Urea does not yield any ammonia under these conditions.—H. Wiessmann, *Landw. Versuchs Stat.*, 91,347 (1918); *Jour Soc. Chem. Ind.* 37,532a (1918).

⁂

Official Control of Antipneumococcus and Antimeningococcus Serums.—A summary of the results of tests for potency. Work now in progress is expected to result in the adoption of test serums which manufacturers may use for comparative testing. It seems unlikely that the same exactness that obtains in testing diphtheria antitoxin or tetanus antitoxin will be accomplished with antipneumococcic or antimeningococcic serum, but the user may be assured that either of these preparations on leaving the manufacturing establishment is of as high degree of potency as it is practicable to attain.—G. M. McCoy and J. P. Leake, *Public Health Reports*, August, 1918.

⁂

The Prevailing Pandemic of Influenza.—The disease is characteristic of the ordinary endemic influenza, but it is more severe and much more contagious. It is caused by a specific virulent strain of the influenza bacillus, against which individuals of the younger generation have relatively no immunity. In from 5 to 10 per cent of the persons afflicted, it develops into a massive and very fatal broncho pneumonia. This pneumonia is primarily caused by the influenza bacillus, this micro-organism being recovered from 82.6 per cent of the lungs at necropsy, in 31.6 per cent of which it is found in pure culture. The pneumonia is frequently complicated by pneumococcus or streptococcus infection. The disease is not due to a filtrable virus. This has recently been determined in an experiment performed in conjunction with Prof. Milton J. Rosenau of Harvard Medical School.—J. J. Keegan, *Jour. Am. Med. Assoc.*, 71,1051 (1918).

(*Continued on page XVII*)

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THE RELATION OF WAGES TO THE PUBLIC HEALTH.

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and
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To be read before the Sociological Section, American Public Health Association, December 9–12, 1918, at Chicago, Ill.

In times gone by public health workers concerned themselves almost exclusively with epidemic diseases, such as smallpox, cholera, yellow fever, diphtheria, and the like. Many of these have been brought under practical control. But now the new public health workers have gone farther afield and are also concerned with all preventable diseases and conditions which influence their prevalence. In their investigations they find that there are many factors which are involved in the spread of disease other than the germ which causes it.

Prominent among their findings is the fact that economic conditions have a very manifest relation to disease prevalence. There is nothing new in the existence of such a relation of course. It has existed as long as the conditions under which people live have been purchasable. The surprising thing is that public health workers, even in recent years, have not realized more fully that the possession of those conditions which are favorable to health depends in large measure upon the individual's or the family's ability to purchase them. As the result of progress in disease prevention, we have revised and added to the requirements for a healthful environment; yet the increased burden that at least some of these improved requirements place upon a large proportion of the population too often has not been taken into account.

The fact is, poverty is the greatest problem in public health. The health officer of any large city has only to study his sick-rate according to wards to find that his rate is usually highest in the poorest sections. It matters not whether poverty is a cause of sickness or sickness is a cause of poverty; the public health worker is greatly concerned over the problem of sickness and poverty and its relation to income and the cost of living. When the cost of living is going up by leaps and bounds, health officers may well expect that the sick-rate will soon begin to climb unless family income keeps pace with it.

It is difficult, if not impossible, to untangle that bundle of conditions known as poverty. In order to suggest in a very general way, from the standpoint of health, what a few of the principal economic conditions are that may influence the health of a population, some analysis may be made by considering the chief items that have been found in numerous studies of wage-earning households to constitute living costs, as follows:

Food: The most important item in the cost of living is food. When the income is not sufficient the family, especially the native born family, is likely to skimp on food in order to make a better showing as to other living requirements.

The effects on health when the diet is reduced below physiological needs, in quantity or quality, are well known. The effects of inadequate or improperly balanced diet are factors in the causation of sickness which have been noted by practically all physicians and health workers. The recent findings of Goldberger show clearly that an unbalanced diet causes pellagra, a disease which is found more frequently in families with low incomes than among the well-to-do. Furthermore, while diet is not a specific factor in the causation of tuberculosis, as in pellagra, the undernourished prove easy victims to the tubercle bacillus.

It is hardly necessary to discuss the effects of inadequate diet now when whole nations are almost starving and when the daily papers are detailing these effects on the morbidity and mortality of the people, especially the very young and the very old. The infant morbidity and mortality rates are very delicate indicators of how the baby population is fed. When babies are undernourished they do not gain in weight as do the babies fed on an adequate and properly balanced diet, and at the end of the first year, if they live, are found to be several pounds under the average. One of the first effects of the war upon the nations placed on an inadequate ration was a tremendous increase in the baby death-rate.

Rent, Fuel, and Light: It is difficult to state just what the effects of bad housing are on health, but the absence of sufficient light; the lack of ventilation facilities, or, when adequate facilities exist, the continuously closed rooms to secure warmth because of the inability to provide sufficient fuel; the accumulation of filth; the prevalence of insanitary toilets; the necessity for overcrowding in order to reduce the rent to a figure which will permit the household to make ends meet—these are fairly familiar facts. That such housing conditions influence the sick-rate is generally conceded. One has only to recall how overcrowding among our soldiers in camp was given as one of the causes of the increased sick-rate from pneumonia and other respiratory diseases in order to realize the results of overcrowding in terms of health.

With the war changes, new problems in housing have presented themselves and have become so acute in many places as to require governmental aid. In providing proper housing under these changed conditions special care should be given to their relation to health.

When soldiers are brought together in barracks the control of communicable diseases becomes a very serious problem, even though under military discipline. When industrial forces are brought together in dormitories, lodging-houses and the like, without military discipline and military medical supervision the difficulties of control of communicable diseases will be multiplied.

Clothing: Another important item in the cost of living as related to health is an adequate supply of hygienic clothing. When children are "sewed up" for the winter it has the same effect on their health, no matter what may be the reasons for such action. Economic conditions may not be the province of the health workers but when such disease causing conditions are found they can hardly refrain from drawing the conclusion that the cost of clothing has some relation to the inadequate supply of clothing.

Again there is found in the last winter's experience of our army an example which shows the relation of the living necessities to health. The lack of a sufficient supply of warm clothing was given as one of the causes of the high sick- and death-rates from pneumonia and other respiratory diseases.

Medical and Hospital Care: Adequate medical and hospital care is another important item in the cost of living which is directly related to health. If the average sickness expectancy is in the neighborhood of nine days per person per year and something like 500 out of every 1,000 persons are sick each year, it necessarily follows that this item of cost is considerable and if adquate care is not provided sickness is likely to be prolonged, spread to other members of the family and to fellow workers, and cause much preventable invalidism and many preventable deaths.

In considering the above items in the cost of living, the health workers are primarily concerned as to the adequateness of each item as related to health. Their interest ceases when the diet is sufficient as to variety, quality, and quantity; when housing conditions are good as to room space, heat, light, ventilation, cleanliness, and the like; when the clothing is sufficient as to quality and quantity, according to season; when medical and hospital care is adequate; and when there is a balance left over to meet the cost of healthful recreation.

The practical question arises: What wage or family income is sufficient to maintain health among the industrial population?

Obviously, the health worker in any mmunity needs an answer to this question. It is as fundamental in working out practicable measures for remedying conditions as it is in interpreting vital statistics and in evaluating the influence of various conditions that affect the health of a population. Yet few questions are more difficult to answer. Living costs differ widely among localities. Habits of consumption vary not only among individuals and households, but also among populations of different localities and races. Changes in prices and in wants are multiform and often sudden. In spite of numerous cost-of-living investigations, there has been a dearth of comparable data, and we have in this country no dependable consumers' index of changes in living costs. Furthermore, we are barely upon the threshold of an understanding of what economic conditions really mean in terms of health.

From such data as are available, however, a tentative answer has been attempted. It is a rough average and has, therefore, the faults of generality and of the statistical average. In 1913 to 1915, the writers, then employed by the United States Commission on Industrial Relations, compiled the findings of a number of investigations made of the cost of living. Most of the investigations were made during the period 1907 to 1912. In addition, the compilations included a consideration of the cost of the ration for the United States Army stationed in the United States and that of the United States Public Health Service during 1910, 1911, and 1912. The figures of cost were based on the needs of the average family of five persons—father, mother, and three dependent children. The needs of such a family, from the point of view of food cost, were considered equivalent to 3.3 adult male units.

After giving careful consideration to all of the investigations, the conclusion was suggested that the average family at that time required an income of about $800 or more per year. To be adequate such an income would have to be expended with great care for the following items approximately in the proportions as indicated:

Food	47%	$360.00
Rent	17%	126.00
Clothing	16%	123.00
Sundries	13%	98.00
Fuel and Light	5%	41.00
Health (doctor, dentist, etc.)	2%	17.00
	100%	$765.00

As stated, this estimate of a minimum of $800 annual income for an "average" family was based on prices prevailing during the five-year period prior to 1913. Since then, it is well known, there has been a tremendous increase in the cost of living. A variety of estimates of what this increase has amounted to have been ventured and a number of local inquiries have been undertaken by employing establishments, unions, and governmental agencies. The Bankers' Trust Company of New York City, for example, appointed a committee to investigate the subject in a careful manner prior to making a conservative compensation to its employees for the increased expenses of living. This committee, using the authoritative and established wholesale price index numbers published by Bradstreets and Dun's commercial agencies, by the Federal Bureau of Labor Statistics, and by the *New York Times Annalist*, and accepting the Bradstreets list of thirty-four essential commodities of food and clothing, found that the increases in living cost between 1914 and January, 1918, shown by these authorities, were from 75 to 93 per cent. The Federal Bureau of Labor Statistics recently has been conducting a number of investigations in important industrial centers and has in the last few weeks reported increases (based upon retail prices) in the cost of living among wage-earning families in the New York, Philadelphia, and Boston districts were from 62 to 67 per cent since December, 1914. The percentages of increases for various items of expenditure were stated to be as follows: food, 65.4 per cent; rent, 5.5 per cent; clothing 103.4 per cent; furniture and furnishings, 104.7 per cent; fuel and light, 25.2 per cent.

A conservative conclusion, therefore, appears to be that if $800 was barely sufficient to maintain an "average" family under healthful conditions of living in the period 1907–1912, approximately double that sum is necessary with the present scale of prices. Whether or not the greater opportunity for regular employment and increase in wages have actually made a corresponding increase in family income general among the wage-earning population remains to be determined. But in families where incomes have not kept pace with the cost of living, the pressure of higher living costs properly may be regarded as a possible factor in causing a higher morbidity and mortality incidence. The fact that food is normally the largest item of expenditure among wage-earning households suggests that families with lowered economic status are likely to skimp on food and become undernourished in order to live up to certain other standards regarded as necessary. Or, nursing mothers may be compelled by higher living costs, or encouraged to seek employment with consequent dangers both to themselves and their babies. Or, to avoid a lowering of the scale of living, children may be sent to work too young, or for too long hours, with obvious results on health. Particularly at this time, when the need for the greatest efficiency in production is so pressing when the present and future vitality the nation is more precious than ever fore, and when economic changes ar violent and so pronounced, the nec for giving careful and openminded consideration to the effects of economic conditions upon health is of utmost importance.

It is encouraging, from the broad viewpoint of health in relation to all of the conditions of living, to note that the relation of economic conditions to the health of groups of people is becoming well-recognized. Such conditions are reflected in mortality rates in recent studies by the Federal Children's Bureau and have been pointed out by many observers. One of the conclusions reached by the Framingham Community Health and Tuberculosis Demonstration, for example, reads as follows:

"* * * the less prosperous districts have markedly higher general death-rates, and markedly higher rates from the chief causes of mortality, a fact which indicates the importance of the economic factor and the need for special effort in disease preventive work in poorer districts."*

In like manner, economic conditions are reflected in the sick rates, but there are no extensive adequate morbidity reports to indicate their influence. Schereschewsky's physical examinations of garment workers in New York City in 1914 developed the fact that although no definitely vocational diseases were found, a distinctly greater incidence of tuberculosis, anæmia, and poor nutrition was present among the most poorly paid workers than among those whose earnings were relatively high.* More recently, Sydenstricker working in the pellagra investigations of Goldberger in seven cotton mill villages in South Carolina, kept an accurate record of all of the cases of disabling sickness found among a population of 4,000 in May and June of 1916. A tabulation of these records according to family income showed that among persons of similar sexes, ages, and occupations, the sickness rate per 1,000 varied from 18.5 in the highest income class to 70.1 in the lowest income class.

In view of the very obvious relation of wages to the public health, it is also encouraging to the public health worker to note the recognition of the principle of a "living wage" as essential to the healthful standard of living and that the Congress a short while ago created a minimum wage board for the District of Columbia. The National War Labor Board, on which both groups, employees and employers, are represented, have agreed that a "living wage" should be one of the important principles governing their decisions, it being recognized that a living wage is essential to a healthful standard of living.

Developments of this character coming out of the war will make the fight for democracy the greater victory.

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* Framingham Monograph No. 3—Vital Statistics, p. 23.

* Health of Garment Workers—The Relation of Economic Status to Health, by B. S. Warren and Edgar Sydenstricker, with an introduction by J. W. Schereschewsky. *Public Health Reports*, May 26, 1916 (31: 1298–1305).

WHAT IS THE RELATION OF WAGES TO PUBLIC HEALTH?

ARTHUR E. HOLDER,
Member of the Federal Board for Vocational Education, Representative of Labor.

To be read before the Sociological Section, American Public Health Association, December 9–12, at Chicago, Ill.

THE health of the child is the strength of the nation.

The power of a country, the happiness and security of a people rests on the broad base of public health.

The first duty of man should be to preserve his health. The first and most patriotic duty of a statesman should be to care for the health of the people.

What is the relation of wages to public health? It is not possible to adequately cover this question in the short space of fifteen minutes. The subject can only be roughly sketched. There is no problem more vital. The term "wages" is applied to the incomes of working people.

The working people and their families constitute the majority of all countries. It is safe to say that in the United States the ratio is easily 9 to 1 if we include as we should agriculturists and such workers whose incomes are rated as salaries.

It follows as a matter of course that whatever affects a proportion so large, automatically affects the relation of the whole.

Therefore, wages and health are reciprocally related, each affecting the other. The higher the wage, the better the health of the wage workers, may be accepted as axiomatic. The better the health of the wage workers, the better the health of the public. Improvement in public health means increased total production and prosperity, greater safety, more happiness The reasoning is easy.

This leads us to other questions, vital parts of the original. First, are wages sufficient to keep the wage earner in good health? Second, is the public health maintained satisfactorily?

The flourishing existence of many large sick and beneficial societies, like the Odd Fellows, Foresters, K. P's., K. C's., Workmen's Circles, Trade Unions, Masonic and other fraternities merit a negative conclusion. Some assert that the very existence of such organizations are equivalent to an indictment of our present wage system and our lack of system in caring for public health.

If statistical information is helpful to a clearer light, consider the following facts: In 1910 over 38,000,000 persons were engaged in gainful occupations. "Manufacturing and mechanical" absorbed 10,808,000. I select this the largest group of wage earners for my illustration and find upon analysis of census bureau reports that our industrial progress is unbalanced.

THE WAGE EARNER'S SMALL SHARE OF WHAT HE CREATES.

In 1850 the value of our average annual per capita product in manufactures, was $1,064. Sixty years later, in 1910 the average per capita production had increased to $3,125. Wages paid employees of manufacturers averaged $247 in 1850. In 1910 wages had risen to $518. an increase of only 109 per cent as compared to 193 per cent increase in average production. Carrying this analysis farther we find that in 1850 the wage earner obtained 23¼ cents of every dollar's worth of value he created. In 1910 this proportion of product had shrunken so the wage earner got only 16 cents and one-half on each dollar's worth of goods he produced.

This is the base or foundation of the question: "What is the relation of wages to public health?"

The next view reveals the first effect—which we may identify as "instability of industry"—or, "depression in business," more commonly known as "panics."

This brings us to a debatable inquiry, "What causes panics?" High tariffs—low tariffs—gold standards, silver standards, good crops, poor crops—or spots on the sun? All of these and many more excuses have been given and explanations elaborately made by highly gifted scientific men.

Unfortunately, but few have seen the truth or grasped the facts that panics are brought about more by inequitable distribution of wealth than any other cause.

Formerly when the laborer got 23 cents in wages for each dollar of his product, panics occurred about once in twenty years, as witness 1837, 1857, 1877. Since real wages shrunk to 16 cents on the dollar, panics roll around more frequently as the record shows, 1884, 1894, 1907, 1914.

What has business activity or panics to do with public health? No other factor in modern life is so powerful, nothing influences our individual health more than severe changes in our economic life. During busy periods men work at high speed and high tension from early in morning till late at night. They are literally rushed to death.

During panicky periods, the workers and employers spend a large part of their energy and vitality fretting their lives away for fear their jobs or their business will suddenly cease and leave them economically stranded.

This answers the question and explains in concrete form the relation of wages to public health.

All medical men agree on three prescriptions for many human ills; first "do not worry"; second, "take a rest"; third, "go away for a change."

The first seems humanly impossible to avoid, the last are too expensive to indulge in by that great army of the public that work for wages. Hence, small ills grow into great chronic afflictions—you physicians know the balance of the human story too well for further reminders.

This brings our query to the relation of working hours of wage earners to public health, and is answered by recalling your attention to the tenacity of the workers for eight hours or a shorter working day.

The Eight-Hour Day Adds Years of Life to Workers.

Wage workers find this the most effectual way to more equitably distribute social wealth and the greatest preventive of disease. Since the union cigarmakers adopted the eight-hour day in 1886, from 12 to 15 years have been added to the average life of cigarmakers.

The printers have added ten years to their life since they abandoned the ten,-eleven- and twelve-hour day.

Similar experiences have been proportionately recorded by miners, machinists, bricklayers, needle workers, carpenters, metal polishers—and thousands of other organized wage earners. Our trade union vital statistics also show that many years of life have been added to the wives of such wage earners who have shortened their work day and increased their wages.

Every improvement in group health thus briefly described correspondingly improves the public health.

The greatest of teachers reminded us that "Man shall not live by bread alone." Of course this means all men. We may lay too much stress on the bread and butter aspect of the workers' life, but it should not be forgotten that the wage earner, his wife and children have a spiritual hunger. If time and means will not allow a satisfaction for this hunger, it means that essential joy is crowded out of the workers' lives, thus leaving them subject to nervous ills. Organized wage earners have been righteously jealous of their health. They have been instrumental in securing many Federal and state laws for the protection of life and conservation of health. They never urged such legislation as a special favor for themselves but always for the common good. They have had more struggles with corporations for health and safety conditions of work than they have for wages.

The workers realize with the deepest significance that health is their capital, their chief asset. To lose their health is to lose their power to earn. To keep health or improve health means increasing the power to produce. Wages depend in the last analysis upon quantitative production, the greater the production the greater opportunity is afforded for workers to raise their wage scale.

THE FRUITS OF ORGANIZED LABOR.

The increase and power of organization of workers insures first, improved health; second, increased production; third, fewer accidents; fourth, shorter hours for fathers and mothers; fifth, higher wages; sixth, better education and health of children; seventh, higher grade citizens; eighth, employment of a better grade of certified physicians; ninth, fewer patent medicines, drugs, nostrums, quacks and whiskey.

Let me relate just one illustration from many, gathered during a very busy life. A wealthy mine owner of West Virginia admitted to me in June of this year, that after fighting organizations of his miners for many years, he finally changed his attitude in 1912 and this was the result. Before organization in his field, the highest average production was 5.4 tons per man per day of ten hours. Since organization the average output had risen to 9.2 tons per man per day of nine hours. Fifty per cent less accidents had happened, no stoppages had occurred, no illicit drunkenness reported, less sickness, 50 per cent less labor turn-over, more schoolhouses, finer social conditions, happier neighborhood, a more contented and prosperous boss.

LACK OF VITAL STATISTICS.

If it were possible to secure complete and accurate statistics of men, women and children in this country whose health is impaired and whose lives are materially shortened by employment under conditions which were preventable by the exercise of intelligence and comparatively small cost, the totals revealed would be far more appalling than the losses during the present war.

The losses and sufferings due to preventable ill health tax the imagination. A large part of the country population and the city population as well suffer from unnecessary ill health. Good health is an important factor in the production of wealth, let alone the satisfaction of good health to the individual in his life as a consumer. The need of knowledge along health lines is widely attested. Nowhere does ignorance exact heavier penalties.

It has been calculated that out of our normal industrial army of over 38,000,000 workers, there are at all times about 3,000,000 incapacitated for full service, and it is further calculated that, of this 3,000,000, one-third are from absolutely preventable causes, and about one-third more through causes probably controllable.

THE YEARLY TOLL OF PREVENTABLE DISEASE.

One million five hundred thousand persons die in the United States every year, many of the deaths being premature. It is estimated, no doubt, too conservatively, that for every death there are two additional persons sick, a total of 3,000,000 sick. Some eminent authorities estimate the economic losses each year in the United States due to sickness range from $1,500,000,000 to $2,000,000,000. The greater part of such sickness is preventable. There is no more profitable undertaking than the promotion of health, and no form of knowledge more urgently needed in curricula than effective hygienic science. Tuberculosis might be made as rare as smallpox, but on the other hand the death-rate is high from the disease, being 183.6 per 100,000 in 1907; 500,000 persons in the United States are suffering from tuberculosis. One-seventh of all deaths are due to it. The economic loss in the United States in 1909 from tuberculosis is estimated at almost 50 per cent above the value of the wheat crop of the country.

In 1908 there were 35,000 deaths from typhoid fever and 350,000 cases in the United States. Better local sanitation would have prevented 75 per cent of the cases, while sanitation for the country at large would have prevented most of the remaining cases. Whole families in the country are often almost exterminated by typhoid fever developed from infected wells and insanitary surroundings.

Typhoid has been nearly eliminated in communities where intelligent precautions have been taken. The results of education appear at once in decrease of the death-rate from this disease. About 80 per cent of the cases of typhoid develop from drinking impure water, a cause easily removed by simple scientific methods.

Pneumonia causes a high death-rate, in some cities one-sixth of the number of deaths. Methods of prevention, similar to those for tuberculosis, are well established and would prevent the majority of cases if intelligently employed.

E. E. Rittenhouse, president of the Provident Savings Society of New York, asserts that annually in the United States human lives equalling the population of the state of North Dakota are sacrificed through ignorance and neglect of reasonable and known preventive measures, and that preventable disease and accident yearly destroy more lives than have been lost in all the country's wars since the Declaration of Independence.

ECONOMIC WASTE OF LIFE AND TIME BY INDUSTRIAL ACCIDENTS.

Fearful losses of life and economic waste result yearly from industrial accidents. Unfortunately we are still in the dark as to the number of industrial accidents, notwithstanding continuous demands by labor and forward-looking employers for definite data from state and Federal authorities. The only accurate data on hand is confined to mining and transportation. For the five year period ending December, 1917, a total of 16,526 workmen were killed and over 49,000 injured in our mines and quarries. For the five year period ending December 31, 1917, the railroads of the United States killed 48,801 and injured 931,764. Of the killed and injured more than seven out of eight were railroad employees. It must be remembered that men who work in mines and quarries and on our railroads are picked men. Invariably they are the strongest physical types.

The extreme prevalence of accidents as shown suggests the need of better knowledge of dangerous employments and risky situations. Not a day passes without its toll of avoidable mishaps, entailing pain, expense, household sorrow, permanent injury, public loss. Similar accidents are continually being repeated, but adequate warning is too rarely given.

Individuals learn by experience of the most expensive kind. Mere prohibitions as usually given are not effective. Were a manual of accidents prepared in the spirit of science and widely distributed tens of thousands of accidents with their incidental expense, would be avoided every year. Hundreds of typical accident situations could be demonstrated in laboratories and lecture rooms, and thus an effective experience be had without the wasteful, needless, experience of real accident. It is questionable if people need to learn nearly so much by experience. The purpose of education is to substitute learning by understanding, in place of learning by experience.

We hear much of efficiency experts. I know of no field which presents greater opportunities for their efforts than that of scientifically surrounding workers with conditions calculated to keep them in condition fit to perform their best service.

THE PROBLEM OF EQUAL INTEREST TO EMPLOYER AND EMPLOYEE.

It is too painfully apparent that this problem of health and safety is of equal interest to employer and employee. An injury to one is the concern of all. It is to the interest of all the people of the country to recognize the fact that it is quite as important for men to be kept in the same state of high efficiency as machinery; and other forms of property.

Restriction of output is often justified as necessary in order to preserve the health and vigor of the worker, thereby conserving the human resources of the nation. Energy and ability to produce are the workingman's capital, but it is intangible and is not adequately protected either by statutory law or trade union agreements. Trade unionists know that speeding up beyond definite limits impairs the efficiency of the worker and reduces the total output during his life. From this point of view, it is nothing short of robbery to quickly wear out a workingman and impair his capital while only paying him "existence wages." An industry which uses up the vital energy of a worker in a few years is coining the nation's life-blood into dividends. No industry has a right to more than that amount of the worker's energy which can normally be replaced by proper food and rest. It is obviously to the interest of the worker and of society that over-driving and sweating be abolished. The policy of organized labor toward such a consummation, is acting for the best interests of all society in a thoroughly praiseworthy manner. Restriction of the output of an individual worker during a given day, week or year is justified because it increases his total output and allows the worker to become a better citizen and a more desirable member of society. Careful tests should be made by employers and employees in coöperation in order to ascertain the proper amount of time needed to perform a given job. Systematic investigations of this nature would give definite standards or averages for the output of the average worker.

CONSERVATION OF WORKER'S HEALTH EVOKES SCANT ENTHUSIASM.

Great enthusiasm usually accompanies proposals to conserve natural resources, animal life and food products. This is of course perfectly proper. No criticism is heard as long as the output is limited to save material products from utter annihilation, but when the health of the worker is at stake there seems to be little sympathy with any limitation less than that which the capacity of a skilled, subsidized "pace setter" demonstrates.

The charge of malingering is too thoughtless. The cry of "slackers" frequently unfair.

Listen, gentlemen, and friends of humanity to this unvarnished report of some workmen's experiences:

"Officers of the Oakland, California, Boiler Makers' Union declare that newspaper sensationalism about strikes and high wages in ship yards is 'becoming tiresome.' The publicity committee of this union reports: 'We have made careful estimates and find that there are only 70 men out of the 15,000 working in Alameda County ship yards who are drawing $50 a week or over.'

"The average wage paid ship yard workers is $24 a week. The time limit of endurance for a man working with a pneumatic hammer is six months on general work, and three months on the shell. After that he has to take a lay-off and rest. The average length of time for a man to stay with riveting is three years. Then he must seek other work if he doesn't break down altogether. We have many riveters in the hospital now, suffering from breakdown.

"We know that the government wants ships and we have been willing to waive rules that in ordinary times we have found necessary to protect the lives and health of our members.

"We have waived objection to piece work for the duration of the war, we have waived apprentice rules, we have consented to increasing the number of helpers to each mechanic and we have worked overtime against our wishes in our desire to aid the government get more tonnage into the war.

"Despite these conditions we are being daily misrepresented by newspapers that howl 'strike' when we instruct officers to take up with the government officials the question of health conditions which will prevent physical collapse of our associates."

Without undertaking to enumerate all the efforts by the American labor movement to conserve human welfare I close this recital by recording some of the many declarations in the labor program for health and safety of the workers and all the people.

THE LABOR PROGRAM FOR HEALTH AND SAFETY.

1. Continued agitation for a shorter work day to a maximum of eight hours for all manual toilers.
2. Demand for a higher minimum wage for all labor.
3. Encouragement of out-door exercise.
4. Formation of fresh air clubs.
5. Recommendation of temperate habits, including a diminution of the use of intoxicants.
6. Release from work at least one full day in seven.
7. Playgrounds for children adjacent to all public schools.
8. Large, open "breathing spaces" or parks interspersed in all cities.
9. Total elimination of the sweat shop system.
10. Rigid inspection and enforcement of law in all mines, mills, factories, and work-shops.
11. Saturday half holiday, fifty-two weeks in the year.
12. Incorporation in trade agreements or in collective bargains governing working conditions of provisions for suitable ventilation, sanitation and safety devices.
13. That wherever possible the suburban residence idea be strongly favored, coupled with a demand for one-half rates on steam and trolley lines during the usual hours of going to and returning from work.
14. Further agitation for better rooms and fresh air ventilation in all living apartments.
15. A positive demand for the passage and enforcement of rigid anti-child labor

laws in states where they do not now exist.

16. Abolition of night work by women and minors.

17. Equal pay for equal work regardless of sex.

18. More conferences and better understanding established among employers, workers and physicians.

19. Inauguration of community forums where health conditions can be openly discussed by parents and physicians.

20. Elimination of Latin and substitution of English in prescriptions. This mystifying practice is un-American and does not help practioner or patient.

21. Continuous medical and dental inspection in all public schools at public expense.

22. Complete systems of up to date physical education in all public schools at public expense, with further provision for free examination of adults by medical faculty of schools.

23. Concentration of all Federal health agencies into one department with a secretary at its head, he to be a member of the President's Cabinet.

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SANITATION OF THE EXPLOSIVES INDUSTRY.

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To be read before the Section of Industrial Hygiene, American Public Health Association, December 9–12, 1918, at Chicago, Ill.

THERE are so many things about the explosives industry, viewed from the standpoint of industrial medicine and hygiene, which are exactly like any other industry that I will devote myself chiefly to the points of difference; since others will handle the general industrial problem.

When we speak of the explosives industry as a war problem, it should be borne in mind that it is only its expansion which can be so-called. And even this expansion was accomplished in a large measure solely through private enterprise, during the three years before we entered the war ourselves. Many do not seem aware that all of the explosives which are now being produced in such enormous quantities were on the market before 1914, and the industrial disease hazard in making them was recognized by experienced manufacturers. Yet when hundreds of new factories sprang into existence, the (to them) new forms of poisoning were regarded as something wonderful and mysterious, and became the subject of much publicity. Such publicity has done a great deal of good, no doubt; but it all comes back in the last analysis to the obvious fundamentals long recognized by the older and more experienced manufacturers; that in order to keep from getting poisoned by a poisonous substance, you must not swallow it, nor absorb it through your skin, nor inhale it into your air passages. The precautions which are now so generally promulgated are simply details directed toward accomplishing these fundamentals. The DuPont Company goes about it, when designing a new plant, by getting together the safety, medical, engineering and operating departments in an effort to devise means whereby the apparatus may be so constructed and operated that poisonous dusts and fumes will not escape into the workrooms, and the processes carried on without any of the material having to be touched by the workers. It is only in the measure that it is impossible to accomplish this ideal that special ventilation and other precautionary measures must be relied upon to supplement such rational design.

There is good reason to believe that many of the newer manufacturers had little notion of the poisonous nature of the various materials used and produced in the explosives industry until the matter was forced upon their attention by bitter personal experience. Then they began to write for information to the concerns with more experience, which was of course cheerfully furnished; but the inquiries became so frequent that I finally wrote up the whole list of "Explosives Industry Poisons," and published it in the *New York Medical Record*, January 20, 1917. Nevertheless it is strange that there should have been such lack of knowledge upon the subject, even in the beginning; for our first American text book on occupational diseases (Dr. W. G. Thompson) appeared in 1914, and this book mentions many of them—TNT being described under "Triton," as it was then known.

There certainly can be no excuse for lack of such knowledge now, for since my own contribution the medical journals and various government publications all through 1917 and 1918 have fairly bristled with it. Notable contributors have been Dr. Alice Hamilton, Dr. Schereschewsky, and a number of others to whom I would like to give credit, whose names I cannot for the moment recall. But probably no other contribution so well crystalizes all of this information into shape available for practical use as the work done by Dr. Evans and his subcommittee on the Advisory Board, Council of National Defense, which was published as "Welfare Work Series No. 2."

Aside from its industrial poisonings, the chief features which distinguish the explosives industry from other industries are the ever-present possibility of an explosion, and, as a result of this possibility, the selection of isolated localities for building the plants. We all know the difficulties which have attended war expansion of ordinary industries due to the housing and other problems, which quickly become acute with the influx of thousands of new workers. If they constitute a problem in ordinary industries which need no isolation, imagine what this must be when isolated factories must be built, often in sections that have been avoided by others for good and sufficient reasons. To make these places habitable and healthy in the first place, and then to make them really attractive places to live in by instituting all those various activities which have been collectively designated as "welfare work," so as to have a contented and permanent works community with slight labor turnover, has been no inconsiderable part of the explosives industry war problem.

Building up a medical and surgical organization to take care of the needs of employees and their families in these widely separated localities has been one element of this work which required much thoughtful study. I often reflect upon how relatively simple a matter it would be to care for the 100,000 or more employees and their families in my own Company if I had them all together in one community—what a magnificent hospital we could have, and how we could install the "group system" of practice, like that at the Mayo Clinic. Instead of that, we now have to divide the medical service up into units of various sizes, some of them caring for only 100 employees, while others have to care for 20,000 to 25,000.

Not the least of the problems of the Medical Department is the maintenance of an adequate personnel. We lost practically all of our younger doctors at the time of the first draft, and since then a considerable percentage of the middle-aged ones have gone into the military service. Who can blame any physician with a rugged constitution for preferring to serve his country in the glory and excitement of the battle front, with all the prestige and military honors such service gives, rather than in obscure isolation on an explosives plant, even though both forms of service are equally necessary? Nevertheless, the loss of each of these men who leaves us is a distinct handicap; for the new man has to be trained into a number of duties and occupational diseases which he has not met with in ordinary practice, and new men are getting more and more scarce. We are obliged to get our recruits either from those turned down by the army, or from those of more mature years. Of those rejected by the army, many have been so from such causes as apply equally to our service; but some of them we are fortunately able to use. Of the older men, many have families to support and expenses to meet for which our rate of compensation is not adequate, and I have not yet succeeded in getting it placed high enough to tempt many of them. Besides this, they are often looking after not only their own practice, but the patients of one or more brother physicians who are in the service as well, turning over a good proportion of the earnings from their colleagues' practice to the latter's families. For these reasons, our force of physicians is often inadequate, and when we have an epidemic like the present influenza outbreak we are surely in trouble. I have, as you may well imagine, a warm spot in my heart for those physicians who have stuck by us. They are doing their bit, for I do not believe there is a single one of them but could better his financial income by going into private practice within a short distance of his present location.

The woman worker is becoming more and more in evidence in the explosives industry as she is in others, and might by some be regarded as one of the "problems." To me, however, she seems far more like the most welcome solution of a problem. As regards the medical department, we simply take care of her by adding the necessary number of women physicians to the staff, and we try to treat her as we would like our sisters and daughters treated if they were left behind while we were on the firing line "over there."

These women employees are certainly a success. All they seem to expect is that they be given the same treatment as men, and they make loyal, plucky and conscientious workers. A little judgment is needed, however, in assigning them to work which at least approaches the capabilities of women; if this is exercised they frequently do far better than men have done at the same work.

There really does not seem much more to add to my part of the discussion, for you are all far better acquainted with the explosives industry than you were a few years ago. It is a welcome change from the days when, if I mentioned my medical department, I was immediately asked "what I needed doctors for—a staff of undertakers would seem to be the appropriate thing." People are coming to realize that we who work in the explosives industry are after all like other human beings—we have our sorrows and joys, our sicknesses and minor injuries, just like other people; and that while sometimes a disaster may come to rob us of father, brother, sister or friend, it is not the explosion risk which is the chief reason for maintaining a medical department on a powder plant.

CIVILIAN TUBERCULOSIS CONTROL FOLLOWING WAR CONDITIONS.

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To be presented before the Sociological Section at the Chicago Session of the American Public Health Association, December 9–12, 1918.

IT is the object of this paper to pay special attention to municipal problems in tuberculosis control, and to present the subject more from the point of view of the intimate control over the tuberculosis case in the average American city than to attempt an extensive analysis of the way in which the war has affected the national tuberculosis question. Others have dealt with this aspect many times, much more effectively than could the present writer. Certainly, the municipality is a most important unit, from the functional aspect, in tuberculosis control. It is here that agencies come most frequently in direct contact with the problem. Further, it is to this type of community that the experience of the writer has been largely confined in tuberculosis work.

Everywhere one finds increasing evidence that the war has magnified the extent and seriousness of tuberculosis. The draft examinations have shown that tuberculosis exists to an unsuspected extent in this age group. Approximately 40,000 men were rejected in the first draft as tuberculous. Of the men who passed the draft boards another 10,000 were subsequently discharged on account of tuberculosis, giving a total of 50,000 men. It has also been stated that among the soldiers being returned from France for one cause or another, an extremely large percentage is sent back as a result of the development of tuberculosis. Finally, the experience in the other countries would lead us to believe that the combination of privation and overwork at home will lower resistance to disease and increase the prevalence of tuberculosis in the civil population. A reduction of food supply in both quantity and quality is likely to induce a state of under-nutrition, particularly among children.

Among adults, excessive work, mental stress and worry will lower vitality and increase susceptibility to infection and disease. These indirect effects of the war are clearly evident abroad and may become increasingly evident in America.

Evidence of increase in civilian tuberculosis is shown directly by the statistics of the warring countries. The registrar general of England reports an increase of 16 per cent in 1915 over the preceding year. In Holland, the tuberculosis deathrate per 100,000 jumped from 154 in 1915 to 180 in 1916, while reasonably reliable data coming out of Germany indicates a 50 per cent increase in tuberculosis mortality in Berlin in 1917 over the preceding year.

It is the plan of this article to discuss first the routine health machinery for tuberculosis control which to a greater or lesser extent has already been accepted and established as standard in the average American community. It is then proposed to indicate, how, on a basis of recent experience, particularly in Framingham in connection with the Community Health and Tuberculosis Demonstration, this routine machinery may profitably be expanded to meet the urgent needs disclosed and augmented by the war. Without adopting hard and fast limitations, there may be presupposed a typical American community, autonomous industrially, with mixed races, varied economic groups, and an average health machinery together with the usual medical constituency.

What are the devices which the average community has already in some degree developed for the detection, control, and elimination of tuberculosis? In a general way these may be indicated as follows:

1. Tuberculosis dispensaries.
2. District nursing, primarily for the home treatment of tuberculosis cases, and in certain instances for the detection of the disease.
3. Hospitals and sanatoria for the treatment of institutional cases.
4. Certain allied activities which tend to some extent to affect the problem, including infant welfare work, medical school inspection, industrial clinics, etc.
5. The educational, recreational, and health creative activities, aiming toward an increased resistance to infection and disease.

From the war point of view as it affects the civil population, what are the main points to be emphasized at the present time, and what are the particular items of municipal equipment that might presumably be added to complete the community's defense against tuberculosis?

1. It is first necessary to recognize the magnitude of the job. Tuberculosis exists in the civilian population to a greater extent than has been realized, it can be found and brought under control, and should be found early, for there lies the hope of ultimate eradication. These premises, particularly those bearing on the extent of tuberculosis and the ability of the average community to find the disease, have been substantiated by the Framingham experience. In 1916 there were 40 known cases of tuberculosis in Framingham, which was .25 per cent of the population, or 3 cases to every death. During 1917 and including 1918 to November 15, there were on record 242 cases. Of these, 27 were inherited from 1916, 96 were discovered in the special medical examination drives, 13 were found in the draft, 53 were found through the expert consultation service of the Community Health Station, 40 were reported by private physicians, 2 were found in the factories, and 11 were discovered by the school physician. In addition 69, coming from miscellaneous sources, are still held as suspicious cases. In contrast to 27 living known cases at the beginning of 1917, there are now 181 living cases, 45 of which are incipient, 23 advanced, and 113 arrested. Of the 4,473 individuals examined in the special medical drives, 96, or 2.16 per cent, were found to be tubercu-

FIGURE 1. Tooth Brush Drill by the Nation's Future Defenders, so that Future Draft Boards may have fewer Rejects on account of Defective Teeth.

lous, instead of .25 as was the case in 1916. This would mean that there should be in the community 367 cases or 21 cases for every death instead of 3 for every death as was the case in 1916. It is believed that it is safe to assume that the group examined were fairly representative of the community at large. However, 56 per cent of the cases discovered were arrested, which would leave 161 active cases in the community, or 9 active cases for every death. Presumably, this is about what ought to be under care in the average urban community in the United States.

These medical examination findings, together with the draft, have shown clearly that tuberculosis is there and can be found if it is looked for.

2. Obviously, more adequate facilities are needed along all lines, including dispensaries, hospitals, nursing service, etc. Better methods of home treatment and isolation are essential. The recognition by the average citizen that tuberculosis should be handled as a communicable disease is vital to its effective control. Legislation for the control of incorrigibles would also seem to be desirable in many places.

3. More extensive and more aggressive health creative work, carried out on a community-wide basis would aid in establishing a firmer foundation of health and would increase resistance to tuberculosis. Prominent among the agencies of recent origin which may be used in this work are the Junior Red Cross, the Health Crusader organizations in the schools, the recreation program backed by the National Government, the Babys' Year program of the Federal Children's Bureau, etc.

4. As a general health program, aimed particularly at tuberculosis control, in addition to the routine measures mentioned above, there are certain special measures which should be emphasized, which aim at particular age groups, and which provide for the discovery and treatment of the disease as well as for its prevention. These may be briefly itemized as follows:

(a) Milk sanitation. It has been recently pointed out by Cobbett that that percentage of cervical adenitis among children which is definitely tuberculous is of bovine origin in 75 per cent of the cases. The universal pasteurization of milk, probably in a central plant under official control, would seem to be the only immediate and really expedient measure for the meeting of this situation.

(b) Infant welfare work. The general hygiene of the infant, the protection of the infant from adult human infection, the control over nutrition, extending especially to the pre-school age, are factors of prime importance in resisting the spread of infection and the development of tuberculous disease in this age group. It is generally accepted that most tuberculous infections occur at that time. A recent Von Pirquet tuberculin study of children between the ages of one and seven years in Framingham indicated that 33 per cent of them had already been infected, though up to that time the cases of actual disease were very few.

(c) Thorough medical supervision for the school population. For every 3,000 children there is needed a minimum of one full time physician with two nurses, with adequate clinical facilities. An equipment approximating these requirements in Framingham in the last year, examining about 2,500 children, discovered 10 positive cases of tuberculosis, and has under observation in addition 64 suspects.

(d) Factory medical work. Full time medical, nursing and clinic service for industrial workers is particularly vital at this time if the producing army is to be kept fit. This service may be largely diagnostic in character, the treatment facilities being found outside the industry, either through private medical service, or as a result of the establishment of pay, self-supporting clinics with paid doctors. Adaptable to the smaller plants is the coöperative plan of sharing the part time of physicians and nurses trained for industrial work.

5. It is, of course, necessary that each community provide adequate machinery for the follow-up of tuberculosis cases brought out by the draft examinations, returned from the cantonments, or sent back from France. This, being a direct and obvious war problem, will probably be more readily recognized by the civilian health authorities as one needing immediate provision, than some of the more indirect phases outlined above. Of course, the recent influenza epidemic has greatly increased the need for adequate follow-up machinery.

6. In addition to these general semi-routine measures, the Framingham experience has indicated the worth of certain special measures, which, when definitely determined to be of permanent value, should presumably be adopted, as a part of the regular machinery in the ordinary municipality. For convenience, these measures may be considered as they affect the discovery, the diagnosis, the treatment, and the prevention of tuberculosis.

I. The Discovery of Tuberculosis.

(a) A community-wide general examination campaign. In Framingham this has been carried out largely with the aid of outside physicians, who, with the necessary nursing and laboratory assistance, have examined extensively in the homes on a family basis. Approximately 5,000 people have been examined to date in this way. This stimulates an interest in life extension work in general, aids in gaining the interest and coöperation of the local physicians, finds a large amount of tuberculosis, and leads to adequate follow-up measures. As stated above, 2.16 per cent of those examined in this way or 96 cases in all were found to be tuberculous.

(b) The consultation service. Growing out of the examination campaign has come an expert consultation service which is an extremely valuable adjunct to the

Fig. 2. Due Largely to the Impetus given by Baby Week, Framingham's Infant Death Rate was Reduced from 90 per 1,000 Living Births to 67.

ordinary dispensary facilities. Experts are provided on either a free or pay basis, and are at the call of the local physicians in doubtful cases of disease, particularly tuberculosis. In this way 37 cases have been discovered thus far and consultations are now held with local physicians continuously, practically all of the physicians using the service. This service, of course, requires expert training and, obviously, considerable tact on the part of the specialists. The advantages are that it finds the doubtful cases, relieves the local physicians of the burden of assuming a diagnosis, and, through contact with the local physicians, greatly increases the control of the home cases.

(c) The stimulation of reporting. Through the examination work and consultation service, and through the coöperation of the local physicians, the reporting of disease may be augmented. During 1906 to 1916 in Framingham, the local physicians reported an average of 13 cases a year. In 1917 they reported 59 cases. Many of these were incipient cases and were discovered through an increased interest in and knowledge of the disease on the part of the local practitioners.

(d) The development of neighborhood committees. In Framingham the town as a whole has been divided into a number of districts of approximately 500 people. In these districts the personal leadership and enthusiasm have been found and local committees developed, the personnel of which represent the Health Station in the various neighborhoods, and aid extensively in the dissemination of information, the carrying out of educational procedures, the development of examination work, the discovery of new tuberculosis, the confidential follow-up on incorrigible cases, etc.

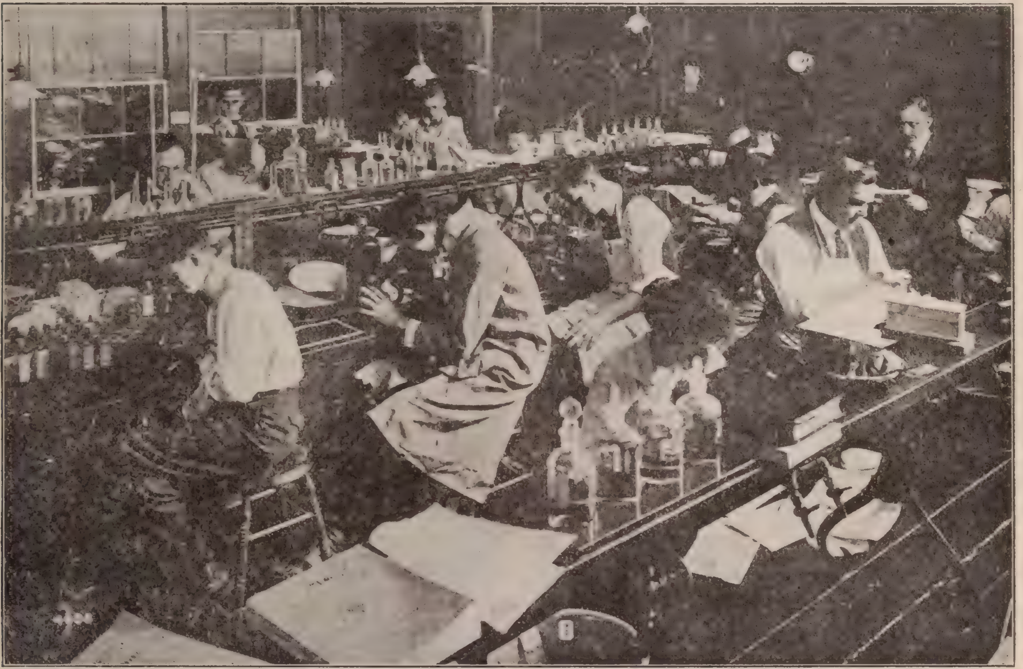

Fig. 3. The Laboratory of Framingham's Normal School was a Busy Scene during the Week that 2,500 Citizens of the Community were Examined.

II. THE DIAGNOSIS OF TUBERCULOSIS.

(a) A local medical organization. Through the development of a local medical club, under which auspices lectures and clinics are held and literature distributed, there may be fostered an increasing interest in the medical aspects of tuberculosis, reflecting itself in the frequency and accuracy with which early disease is diagnosed.

(b) Diagnostic standards. For use in Framingham and elsewhere, there have been developed, with the aid of special committees, standards for the diagnosis, classification and treatment of pulmonary tuberculosis in adults and children, and for the diagnosis of tuberculous cervical adenitis in children. These have been disemminated widely and in addition to their use in Framingham, have been circulated by state Departments of Health and other agencies extensively throughout the United States.

III. THE TREATMENT OF TUBERCULOSIS.

(a) Home control. A competent and adequate nursing service, the medical examination and consultation work, the educational work of the neighborhood committees, etc., all make more practicable the home treatment of a large percentage of the tuberculosis cases. In Framingham on November 15, 1918, out of 181 living cases at that time, only 23 were away for institutional treatment.

(b) The institutionalizing of advanced and open cases. Either by the municipalities or through state or private aid, there should of course be provided adequate institutional facilities for the care of advanced open cases that cannot safely or adequately, for social, economic or personal reasons, be supervised at home. In Framingham in 1917, out of 18 deaths among advanced cases, 12 occurred in institutions.

IV. THE PREVENTION OF TUBERCULOSIS

(a.) An educational program. The use of exhibits, the development of health crusader clubs in the schools, the development of local lecture bureaus offering instruction and entertainment to clubs, churches, factories, etc., will aid in the promotion of a program for health creation.

(b.) A children's health camp. As a preventive measure an opportunity is lost if those children most needing hygienic treatment are not provided during the summer months with open air, play, and supervision. This activity should presumably be developed primarily for non-tuberculous but delicate, undernourished and anemic children. They may be selected through the examination work, through the pre-school activities, by the school medical and nursing staff, in the tuberculin work if any is carried out, etc.

* * *

The control and the cost of such a community program are of fundamental interest. While in some communities the school health work may be under the direction of the school committee, it would seem a safe assumption that for most places the central authority should theoretically at least, rest with the town health officials. This is certainly true of the infant welfare work, the pre-school work, the general sanitary work, and may in increasing measure, as communities become appreciative of their obligations, be extended to cover health educational work, special consultation and dispensary service, hygienic milk control, etc. Presumably for the time being the development of neighborhood committees, the establishment of factory medical service, and in large measure the special antituberculosis educational activities will have to be fostered under private agencies.

While the expansion of the recognized

routine facilities to cover the special services mentioned above involves an increase in expenditure for the community, it must be realized that many of these services, such as the consultation service, pay dispensaries, etc., may become in part or wholly self-supporting. Without presenting any of the details, it may be briefly stated that in Framingham, where the community was spending about 40 cents per capita at the beginning of the Health Demonstration, the town authorities are now appropriating approximately 82 cents per capita for health work. It is further estimated that $1.00 per capita would cover practically all of the obligations which the community at large would ever be called upon to meet out of public funds. This would cover the infant, the school, the sanitary and the special tuberculosis work. In addition, about $1.00 per capita is required for medical and health work in industry and for general educational propaganda. In Framingham at the present time private agencies are expending an amount nearly equivalent to this estimate. Consequently for a complete program approximately $2.00 per capita is required, about equally divided between private and public agencies.

It is hoped that the results of the Framingham work may establish the permanent value of certain of the measures with which the Health Demonstration is there experimenting. While it is relatively expensive to initiate and carry out these measures, the perpetuation of much of the work on a routine basis, discarding the original experimental scaffolding, ought not to be an undue drain upon the community's resources.

Certainly the civilian health situation requires increasing attention. The war has emphasized and augmented our needs. While we must retrench on non-essentials, this embargo specifically does not cover legitimate community health activities. Never before was the necessity so great for the maintenance of the health of the civil population. If it is wise to say that any one thing has won the war, it is the fitness of the home army. From the tuberculosis viewpoint this offers a real opportunity to bring under ultimate control the nation's greatest preventable health menace. In closing we can do no better than to quote an appeal by Dr. Livingston Farrand, director of the American Commission for the Prevention of Tuberculosis in France, made during his recent visit to his country.

"If I may make an appeal to America, on the eve of sailing again for France, it is this: That the people of America throw themselves into the winning of the war against tuberculosis with the same zeal and efficiency with which they have thrown themselves into the winning of the war against the Kaiser. To make our country really safe for democracy, we must first make it healthy."

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AN IMPROVED FERMENTATION TUBE BATTERY.

William Firth Wells,
Captain, Sanitary Corps, U. S. Army.

UNDER the stimulus of the rapidly increasing recognition of the significance of the B. coli test as a routine sanitary measure of pollution, much critical discussion and research has recently developed aiming at the improvement of the quantitative and qualitative methods of making and interpreting the tests. In 1914 (*Bulletin Hygienic Laboratory* 104, U. S. P. H. S.), the author, while engaged in the investigation of the Potomac River under the supervision of Dr. H. S. Cumming, demonstrated that the principal organisms forming gas in lactose broth which have not the same sanitary significance as B. coli, are anærobes, and can be eliminated by plating on an ærobic medium, such as endo agar. This discovery removed the necessity of making the time consuming subculture tests, and did much to simplify and rationalize the test, giving also, more time to the development of quantitative accuracy. There is now little to be gained in this direction by further perfecting the qualitative technique until the huge quantitative errors which still remain are reduced.

McCrady (McCrady, *Jour. Infect. Dis.*, 1915, 17, p. 183), in an able quantitative critique of the standard method of interpreting the tests, has clearly shown the seriousness of the sampling errors. Apart from all questions of agreement as to the presence or absence of typical B. coli in a given sample of water, the final result is subject to the laws of chance sampling. In the commonest method, where dilution quantities are made in multiples of ten (as 10 cc., 1 cc. and 1/10 cc.) such chance errors in a single examination may easily cause a difference of a thousand per cent in the interpretation of the analysis. The only way to eliminate them is to make intermediate dilutions or otherwise increase the number of inoculated tubes. It is evident also that qualitative discrepancies occurring in a small percentage of tubes become negligible if the number of tubes is sufficiently increased.

A simple rapid method of making a large number of fermentation tubes is, therefore, the surest means of improvng the test. McCrady (McCrady, *Jour. Infect. Dis.*, 1915, 17, p. 183) sought to accomplish this by inventing a battery fermentation tube box holding ten tubes and covered by a single cap. By such an ingenious combination of the bacteriological culture tube with the principle of the petri dish, he could save much time and simplify the technique to such an extent as to make the use of a large number of tubes practicable.

The improved form described and pictured here was developed while in the Public Health Service for use in the field investigation of coastal waters where it has been successfully used for over two years. Each battery is a metal box snugly holding ten Durham tubes projecting about one-quarter inch above the upper edge of the box. The front and back of the box are cut away so as to expose the tubes for making observations. The whole is covered by a deep cap containing an inner layer of cotton to cover the tubes. The tubes used are the ordinary 6 x 3/4 inch bacteriological test tubes with 3 x 3/8 inch inner Wasserman tubes. The battery box is constructed of 24 to 26 gage galvanized iron and makes a compact strong box suitable for rough field treatment.

Many advantages of the battery are obvious, such as the saving in time consumed in the clumsy plugging, handling and marking of individual tubes. Likewise, it is quite obvious that much space is conserved by the close fitting of the tubes without rack space. But the principal advantages arise from the practical manner in which they fit into laboratory routine. A battery contains one sample and each sample is handled as a unit. The battery carries a number corresponding to that on the record card, which is spaced to allow for the position of each tube in the battery. All marking is on the card and so long as the card and battery go together there can be no confusion.

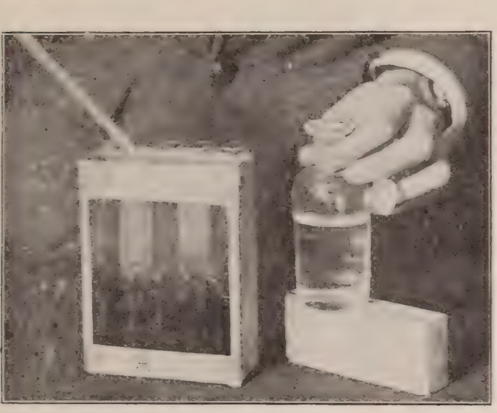

FIGURE 1. Inoculating the Fermentation Tubes.

Moreover much economy is accomplished in the preparation room. Ten tubes are filled without handling plugs; the rack is capped in one movement and sterilized easily. All tubes are kept in the box whether empty or full where they take up very little room, dispensing with storage of awkward racks. Especially can they be recommended in field use because of the protection they afford the tubes.

The objections ordinarily raised by those who have not tried them are theoretical and disappear on trial. Chiefly they reduce to fears of air contamination while the battery is open, or from lack of fit of the cover. It is needless to say that such risks are exceedingly small and do not materialize in practice. The other objection is one which will be considered later in a separate paper on dilutions, namely that the number of tubes is inflexible. This is largely true though it is not a serious disadvantage for a technique can readily be developed to fit the number of tubes which will standardize the method and improve the test. Lastly, no difficulty has been found in obtaining uniform tests.

While the battery described uses ten tubes, the principle can be applied to any number. In the investigation of coastal waters Dr. Carmelia found batteries holding fifteen to be very useful for routine oyster examinations and rapid preliminary surveys.

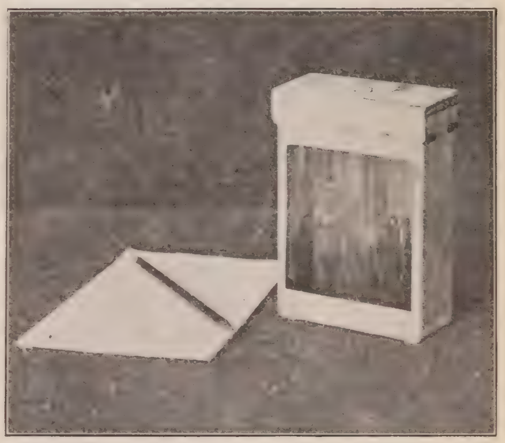

FIG. 2. Ready for the Incubator.

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COLLECTION OF BIRTH REPORTS IN THINLY SETTLED COMMUNITIES.

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To be read before the Vital Statistics Section, American Public Health Association, December 9–12, 1918, at Chicago, Ill.

THE object of this paper is not so much to give information as to raise a few questions. These questions have arisen in connection with field investigations made for the State Board of Health in Minnesota. In most cases the investigations were made in places where it was known that some responsible person had been lax in the performance of his duty. The ultimate object has been the prosecution of the offender. Before filing a complaint, an effort has always been made to learn of still other unreported births than those known in advance. In many instances, I have been able to secure the information from the intended victim himself. For example, in one case I called on a doctor who had reported no births for some two months. I secured data from him and filled out blanks for twenty-six unreported births. After he had signed them I went to the local registrar and recorded them with date of filing and then went to the local justice of the peace with whom I filed a complaint. I chose for the purpose the case of the doctor's own child, the birth of which had occurred some two months previous. To the best of our belief the doctor is reporting cases with laudable promptness at the present time.

THE LOCAL REGISTRAR.

The collection of birth reports, whether in a thinly or densely settled community, involves not only getting the reports in, but getting them correct. Almost the the first point for consideration in discussing birth reporting is the legally established system in that community. Assuming the state registrar's office has adequate machinery for supervising the collection of these reports and for properly indexing and preserving the original reports after they have been transmitted to the state registrar, let us take up the first station, namely the local registrar.

Who shall be the registrar to whom reports are made in rural communities? In cities, having an organized health department, that has been accepted as the logical agency. In the thinly settled agricultural or lumbering townships there is no health department. Generally the town board and town clerk constitute the local government. In Minnesota the town clerk is ex-officio registrar. He keeps the village books including the register of births and deaths. Sometimes he is a careful man but often not and usually unused to keeping records. Moreover elections and changes in this office are frequent. Doctors complain that they are unable to keep up with these changes. The ex-registrar receiving birth reports after he has relinquished his office is very likely to be negligent in forwarding them to his successor. The question arises, would it not be better to have an appointed registrar, to hold office as long as he wishes or does the work properly? Or might it be better to have a county registrar in the county court house, preferably the county clerk? In this case reports so forwarded would reach their destination irrespective of changes in the office-holder. I do not propose to answer this question but raise it in the hope of stimulating discussion and suggestions.

COMPENSATION.

What persons involved in making birth reports should be compensated? The physician or parent? Obviously not. The parent should be sufficiently interested in making these reports for the benefit of himself and his child. It is a part of a doctor's professional duty in a confinement case. This point has been well discussed by Hemenway on "Public Health Law" on page 542. The registrar in the rural districts in propably well compensated by the 25 cent fee provided by the model law.

THE NATURE OF RECORDS KEPT BY THE LOCAL REGISTRAR.

Is a local register needed in every township? It is doubtless interesting and frequently used. On the other hand, these records are often but ill-preserved. Suppose John Jones, registrar, fills up the book he has been using and starts a new one. When he transfers his office to John Smith, his successor, very often he hands him only the new book and forgets the old one. Some years later, when the old book is wanted, the then town clerk knows nothing about it and it is not even remembered who was town clerk when this book disappeared. In view of this carelessness of local registrars, would it not be better that local records, outside the state registrar's office be kept in the county court house?

METHODS OF CHECKING BIRTH REPORTING AS APPLIED TO THINLY SETTLED COMMUNITIES.

The house to house canvass by the state registrar's office in a large state, with many thinly settled townships and poor roads is prohibitively expensive.

Checking up newspaper reports is helpful but not complete. It is worth undertaking when one is interested in a particular community. I find I am able to check from one or two years' files of one country newspaper in one day, and in a district where registration is known to be bad, one can generally locate some of the unreported births.

The town clerk, if he is interested in his work, knows whether or not all births are reported and if the local doctor is careless, the registrar generally writes us about it. Reports of this sort lead to the majority of our field investigations.

Deaths under one year can be checked for birth reports by the state registrar.

We are now requiring all hospitals caring for confinement cases to send us periodically a list of births and deaths in the institution. This allows us to check up both the physicians and the registrars. Official notices posted in conspicuous places, especially in small villages, have been helpful. These should be posted in foreign languages where there are many foreigners in the community.

The practice has been adopted of printing periodically in the local newspapers, a list of all births reported to the local registrar. In the city of Minneapolis, such a list is published each day with a note calling attention to the provision of law requiring such reporting. This is an excellent check and it would be well to induce all newspapers to publish such lists monthly for each of the villages and towns where they have their largest circulation.

THE SCHOOL CENSUS.

The school census, which is taken in many states each year, by the local school directors in each district, might be used to advantage for checking up births as well. This would undoubtedly require legislation. County agriculture agents or county nurses, where they exist, might be used to advantage in checking up birth reports either by educational propaganda which would lead to a demand that they do this work, or by legislation, making it obligatory.

The annual baby week campaign would be useful as a means of checking births, if it could be put in responsible hands. The questionnaire used in weighing and measuring includes a question on birth reporting. This has some educational value which should be followed up. Most parents do not know whether the baby's birth has been reported or not. If a doctor was in attendance they take it for granted and say "Yes."

The certification of registration to parents by the state is an excellent scheme, which is now in use in New York and Massachusetts, I believe. Dr. Eichel can probably tell you more about it than I. It is undoubtedly of great educational value, the chief objection being the expense. No doubt New York spends for this item alone, more than the entire vital statistics appropriation in many states.

Prosecution of physicians and registrars I believe to be the most effective means of all. I do not mention midwives because we do not have many of them in the kind of localities which this paper deals with.

A case I should like to see discussed in this connection is whether, and if so, how many notices and what sort of notices should delinquent persons have of the state registrar's intention to persecute.

COMPLETION AND CORRECTION OF UNSATISFACTORY REPORTS.

Since to err is human, the state birth registration system must as far as possible operate like a machine. The local registrar should be the first cog in this machine. In rural districts the registrar can very often correct the doctor's errors out of his own knowledge. In the agricultural communities, he can do so by telephone communication with parents. We have many local registrars who are most careful to do this.

More often an incorrect birth record passes on to the state registrar and it is filed. A local registrar who knows every family in his district and can correct errors made by the doctor, especially in spelling names, and who fails to do so is doing a great wrong. A misspelled name must be taken on its face by the state registrar and, as it leads often to misfiling, that record may be lost forever. Even though filed by districts and the district is a thinly settled one, the chance remains that a misspelled name may be unrecognized when a search is made, years later.

The state registrar must give much attention to inaccurate records. Much can be done to reduce future inaccuracies by the proper educational matter in the very letter which makes specific inquiry. Form letters of course should be used where possible.

The certification to parents, before mentioned, would be particularly valuable in promoting accuracy. Parents will, in the majority of cases, respond to an invitation for correcting information of their child's birth records and when a certification is returned by the local post office as undelivered the physician may be reached and an important correction made.

FIRST NAMES.

All honor from vital statisticians to the man, if such there ever shall be who will be able to teach people to name their children as soon as they are born. I really have no answer for the man I often meet in my travels, that tells me that birth registration is not worth much because the first name is not reported in 25 per cent of the cases. Again the certification to the parents appeals to me as the best corrective. In this certification a special letter should be used for cases where the baby has not been named. Publication of lists in newspapers should also call attention to the importance of filing supplementals. Until we have a direct communication from the state or local registrar's office to the parents at least a month after every birth, I do not think we shall ever be able to get satisfactory registration of first names. Naming the baby is something which apparently just can't be done satisfactorily until Grandma, Sister Sue and Aunt Jane have had a chance to see that baby, therefore we must do without a first name, until the baby is a month old.

ACCEPTANCE OF GREATLY DELAYED BIRTH REPORTS.

The war has brought a greatly increased demand for certified copies for various uses. There are many more reasons for proving age and place of nativity than existed two years ago. Many of these people were born before birth registration had been established in our thinly settled western states. Shall we allow people to file reports of these births accompanied by a supporting affidavit, showing why the birth record was not registered at the proper time and giving the added evidential support of the sworn affidavit? With such an affidavit, which of course, shows on its face the delayed date of filing of the record, we can issue a certified transcript of both documents and let them go for what they are worth before the tribunal or officer to whom the user proposes to submit them. In Minnesota we have been doing this because we wished to do all possible for the persons desiring transcripts. This is not authorized by law nor is it forbidden. The attorney-general sees no objection to it and has assisted us in preparing a form for these supporting affidavits. I believe New York has a provision of law authorizing this or a similar procedure within ten years from date of birth. I believe the matter should be embodied in the model law but I do not think it necessary to fix the ten year limit.

SUMMARY.

I hope the discussion will cover the following matters:

Who shall be the local registrar?

What book should be kept?

Certification to parents.

The correction of first name.

The acceptance of delayed reports with affidavits.

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FAMILY STATISTICS FROM REGISTRATION SOURCES.

Edwin W. Kopf,
Assistant Statistician, Metropolitan Life Insurance Co., New York City.

To be read before the Vital Statistics Section, American Public Health Association, December 9–12, at Chicago, Ill.

THE facts on the movement of population reported to the practical registrar of vital statistics, as well as the data on the structure of population decennially observed by the census statistician, have bearing upon a number of important aspects of human affairs and relations. There are first the demographic uses of the assembled facts,—description of the structure of population at various points in time, the charting of mortality, and of the diseases causing mortality (in order that the health administrator may know where disease is occurring and where it may be checked), and the tabular display of birth, marriage and divorce data on the forces making for the progress or decline of populations. Second, there are ethnographic uses for registry data, in tracing the history, status and prospects of the races of mankind; third, we have the application of registration data to broad programs of national, state and local administration, the military, judicial, executive and legislative branches of government. Fourth, these collected facts serve students of social relations and reactions, they afford material for inquiry into institutions based upon human association and of organization in social and economic units.

The practical registrar, in drafting the forms of registry for his office, is perhaps guided by current and past demands for facts which it seems possible and desirable to collect. Certificates of birth and death, for instance, have undergone revision in the United States under pressure of urgent requests for necessary data. The recent addition of the name of husband (or wife) of deceased married, widowed and divorced persons, and the names of father and mother of the deceased, probably was influenced by requests from persons who have seen the need for tracing family stems in registration records. Discussion and revision of birth and death certificates has, so far as I can determine from the materials at hand, been limited almost entirely to the demographic and public health uses of registration data. Facts not bearing directly on the causes of death, or on the strictly personal characteristics of the deceased person have been excluded (and rightly excluded perhaps in the lack of strong argument to the contrary) from the records of death in American cities.

The progress of the social sciences during the past decade has shown the need for registration data at present not upon public record. The most urgent need, under the fourth category of service for registration records, relates to the most elementary human institution, the social unit of the family. Discussion of other units of organization, of political units and of social units other than the family, is possible, as arising out of developments in the political and social sciences in recent years, but not pertinent at this time. We should concentrate, however, upon the basic social unit, the family, without which no other abiding units of social organization are possible.

Family Data from Two General Sources.

If inquiry into human institutions is to be more than a fad, the actual facts of the primary forms of association underlying these institutions should be established beyond controversy. Conclusions in the social and political sciences are founded too often upon flimsy bases of fact. This is especially true of prevailing generalizations on the state of the family and of more complex forms of association. Although inquiries into family facts were made on occasion of the 1890, 1900 and 1910 population censuses, no extensive tabulations are available. Various practical, fiscal and other difficulties have prevented the issue of any comprehensive family data from the schedules of the three recent Federal decennial censuses. No family data at all are recorded on the usual certificates of death.

STATISTICS OF THE FAMILY ON REGISTRATION RECORDS.

If and when tabulated the census data on the size and progress of the family constitute perhaps the better records of the two. There is, however, the objection that census data represent only cross-section views of the population at ten-year intervals. Facts on the size of natural families, derived from current registration records, would afford a continuous record of family progress or decline, and would make possible intensive studies of the effect of catastrophic occurrences such as wars, upon the family, close to the time when such events transpire. Where, for instance, are there data at present under registration which will give us a fair idea of the effect of the European War upon the American family? While our registries of vital statistics admirably serve the demographer and public health worker, they fall short in the important respect that they contribute nothing of importance to our knowledge of social facts. By social facts we mean not only the aggregations of mere individuals as shown on the books of the demographer, but also the data on the most elementary forms of human association, which should be, but are not, in the files of the social statistician.

In point of having substantial observations on the family we are but little in advance of the generalizations in the "Republic" and "Laws" of Plato and in the "Politics" of Aristotle. We have no registries of data upon which to outline abiding inductive studies in social statics (or inquiry into social forces in equilibrium), nor for a study of social kinetics (or inquiry into social progress), so far as the family is concerned.

Mere tabular displays of fact on aggregations of living, dead, newborn, married or divorced individuals do not constitute in themselves social data. There must be shown the fact of association.

The Australasians and the Swiss have continuous registration data on families. The substantial contributions of the Antipodes to social progress as regards protection of the family rest upon the sound foundations of fact provided by the progressive social statisticians of that quarter of the globe.

The appeal for similar social facts in America must be made to registrars because the observations can be had only upon the records which pass through their hands on the way to municipal archives. This appeal must be based upon the known interdependence of the sciences and upon the will of the registrar to furnish the raw materials out of which the empirical generalizations of the sociologist may be drawn. Thus there will be provided for the student of contemporary affairs enough data for comparative research, as well as a sufficient supply, for the student of the future, of historical facts. According to Giddings "the comparative method is an observation of identical coherences of social phenomena in two or more places, or in two or more populations," while "the historical method is an observation of coherences through periods of time. The comparative and historical methods may become precise when they can become statistical." The registrar who provides data on natural families from his current records establishes foundations of fact for the sociologist—the student of human aggregation and associations.

Specifically, the registrar should record the live-born issue of each married, widowed or divorced person whose death, remarriage or divorce is reported. In addition, for each such person the number of live-born issue living at the time of the registration should also be recorded. Similar facts should be entered for the mother when the birth of a child is certified.

This suggestion to American registrars does not arise from the enthusiasm of only one devotee of social statistics, but has been offered repeatedly to your Committee on Relation of the 1920 Census to Vital Statistics by students who have submitted their views on needed additions to our records of vital facts. If the genealogists have secured recognition of their necessities in the addition of "name of husband or wife of deceased" and "name of father and mother of deceased" in the latest revision of the standard death certificate, why not the sociologists' requests for data on the primary social unit—the family?

The American Public Health Association, through its Section on Vital Statistics, and perhaps through its Committees on Registration Affairs and on Standard Certificates, should meet the fraternal advances of the social statisticians and say whether it will endorse this request for additional data. By doing so, the Association will show that it conceives more than the narrow precisions of demography, that it concedes a place to sociology in the group of sciences which employ both the method of induction from observed facts and the method of deduction from hypotheses and principles.

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Picking over Sphagnum moss which comes from the coasts of Ireland and Scotland and is used on wounds as an outer absorbent pad, in the American Red Cross workrooms for surgical dressings, Rue de la Faisanderie, Paris. The workers in these workrooms are French women, most of whom have suffered in the war, and are glad to work for the wounded, at the same time making a living under the direction of the American Red Cross.

A COMPARATIVE STUDY OF MILK PLATES BY FOUR NEW YORK LABORATORIES—A PRELIMINARY REPORT.

HAZEL M. HATFIELD, M. D.,
Bacteriologist in the Research Laboratory of the New York City Health Department.

FOUR of the New York laboratories, interested in the bacteriological examination of milk came together recently for the purpose of determining how much of the variations which occur in milk results, when different laboratories attempt to do duplicate work, is due directly to the technical procedure. Our object was to gain information regarding the practical application of the milk test by the plate method as performed today by the commercial laboratories and to compare these results with those obtained, under identical conditions, by the Milk Laboratory of the New York City Health Department.

To determine this point, a set of samples was delivered at the Health Department Laboratory by a collector not connected with the department. They were tested by the plate method in the following manner: Each laboratory represented, used its own sterile glassware, water blanks, agar, etc., exclusively. A definite series of dilutions was agreed upon so that the plates would give results that would be quite comparable. Each sample was shaken by only one worker who shook the sample in his usual manner, removed a portion, and immediately passed it to the next worker, who likewise, removed a portion (but did not shake), passing it on again until each one had taken what he required. The next sample was shaken by a different worker, and so on in turn. From this point on the work was done according to the individual preference of each one and, as nearly as possible, in conformity with the routine procedure of the laboratory each represented. The plates were all packed away in one incubator and incubated for 48 hours at 37° C. They were all removed at the same time and counted by the person who made them. Every plate was counted, even though some of them would have been discarded, under ordinary circumstances, as too poor to be accurate. In those cases we indicated the poor plates.

In general, each plate should have shown one-tenth as many colonies as the plate of the next preceding dilution for the reason that, in every case, the dilutions stepped up one cipher at a time.

The accompanying table shows how the different laboratories fared in this respect, and also how they compare with each other.

It is also of interest to note that samples 4, 5, 6 and 7 were quadruplicates having been taken from the same can after the milk was well stirred. Also that No. 16 was a compound sample consisting of one-half No. 14 and one-half No. 15. No. 8 and No. 9 were taken from the same bottle; samples No. 10 and No. 11 were taken from one bottle.

In addition to these results, a very interesting fact developed. When we came to compare our methods in detail, we found that no two laboratories did their work exactly alike; in fact, there was no point on which all were agreed.

This laboratory follows the present standard methods of the American Public Health Association, in every respect. The agar is made exactly as described in the Standard Methods; we pour 10 cc. in each plate at a temperature of 40° to 42° C. Our water blanks are all alike, the same amount in each one, and are con-

		H. D.	LAB. A	LAB. B	LAB. C.	Raw Milk
1 297	1 : 1000	550 est. per plate	512 est.	320 est.	826	Shaken by Lab. A.
	1 : 10000	110	87	165	124	
	1 : 100000	7 est. spreader	13	21	44	
2 259	1 : 1000	2700 est.	688 est.	1100 est.	1056 est.	Shaken by Health Dept.
	1 : 10000	326 est. ½	29	370	488	
	1 : 100000	3	6	120	133	
3 205	1 : 1000	3279 est.	2250 est.	980 est.	Plate not made	Shaken by Lab. C.
	1 : 10000	424 est. ½	268	275	412	
	1 : 100000	46	18	67	28	
4 229	1 : 1000	1120 est.	384 est.	1440 est.	1600 est.	Shaken by Lab. B.
	1 : 10000	100 est.	81	190	406	
	1 : 100000	7	10	48	144	
5 271	1 : 1000	1000 est. (poor plate)	848 est.	940 est.	892 est.	Shaken by Lab. A.
	1 : 10000	120	122	115	282	
	1 : 100000	9	13	21	34	
6 225	1 : 1000	460 est. ½	480 est. spreader	440	850	Shaken by Health Dept.
	1 : 10000	64 spr.	76	160	268	
	1 : 100000	7	11	28	36	
7 292	1 : 1000	680 est. poor plate	1250 est. spr.	435	896 est.	Shaken by Lab. C.
	1 : 10000	128 est. ½	160	105	238	
	1 : 100000	7	23	21	36	
						Certified
8 267	1 : 10	420 est. ½	427	718 est.	313	Shaken by Lab. B.
	1 : 100	51	42	51	82	
9 273	1 : 10	315 poor plate	339	457 est.	279	Shaken by Lab. A.
	1 : 100	63	36	71	104	
10 263	1 : 10	370 est. ½	338	408 est.	364	Shaken by Health Dept.
	1 : 100	46	33	56	56	
11 278	1 : 10	350 est. ½	295	355 est.	230	Shaken by Lab. C.
	1 : 100	43	33	43	41	
12 249	1 : 100	92 est.	135	254 est.	245	
	1 : 1000	17	13	39	18	Shaken by Lab. B.
13 262	1 : 100	482 est. ½	*	520 est.	374	Shaken by Lab. A.
	1 : 1000	50		51	30	
14 284	1 : 100	412 est. ½	*	504 est.	430	Shaken by Health Dept.
	1 : 1000	44		63	70	
15 216	1 : 100	522 est. ½	381	303	512	Shaken by Lab. C.
	1 : 1000	54	21	47	47	
16 295	1 : 100	480 est. ½	*	230	Plate not made	Shaken by Lab. B.
	1 : 1000	44		35	60	

* Results omitted because of a gross error in making dilutions.
Est. = Estimated.

tained in bottles of heavy glass, large enough to give a sufficient air space to ensure thorough shaking. These bottles have metal caps. Every dilution, therefore, is made exactly like every other dilution and the higher dilution is invariably reached through the lower dilution. We make such dilutions as will always give us at least one easily countable plate, if the milk is not excessively high count for the grade which it is labelled. Where the grade is not known, at least two plates are made. We test all pasteurized milks in a 1-100 dilution; raw milks and pasteurized creams in a 1-100 and a 1-10,000 dilution; and raw creams in a 1-100, 1-10,000 and 1-1,000,000 dilutions. Although we make only one plate on each pasteurized milk, we really do quadruplicate work in each case, because all samples are submitted by the inspector in four portions representing either two or four samples from one source. This gives a more comprehensive view of each source than a single sample could as it shows up irregularities at the dealer's end of the line, also. It must be remembered, also, that no milk is judged on the results of one set of samples. Our files give a survey of a milk supply which can easily be adjudged as good, fair or bad without danger of doing an injustice to the dealer.

Laboratory A uses agar which is intended for certified milk, but is not standard for routine milk work; it contains 1.2 per cent market agar, and 1 per cent peptone and is cleared with egg. Laboratory B uses standard ingredients in standard amounts, clearing without egg, but employs a short cut in making up the media. Laboratory C clears with egg and the reaction is neutral. The ingredients were not stated. All the laboratories except C use an acid reaction of not more than plus 1. Again, this laboratory pours 10 cc. of agar in each plate; Laboratory A pours "about 5 or 6 cc.," B pours "about 8 cc." and C pours at least 12 to 15 cc. Laboratory A prefers to pour the agar at 45° C., the others at 40° to 42° C. All the laboratories shook the dilution bottles vigorously twenty-five times but it was noticed that when C used a tube of water in making a dilution he resorted to a rather gentle agitation instead of the usual up-and-down shake, just enough to make the milk and water appear evenly mixed.

In the matter of dilutions, also, there was the widest variation. The procedure of this laboratory has already been described. For the pasteurized milks, A and B make a 1-100 and a 1-1,000 dilutions, while C makes a 1-100, 1-1,000 and 1-10,000 dilution. Moreover, B sometimes departs from its rule, under certain conditions, and makes only a 1-10. In the plating of raw milks we found that, while this laboratory makes a 1-100 and a 1-10,000 plate, B makes a 1-1,000 for the lower dilution and C makes a 1-100,000 for the highest dilution. As to the manner of making dilutions, in nearly every case the higher dilution is made through the lower dilution, but, again, we found that A, when testing certified milks, inoculates each water blank with separate portions of straight milk. In this case, A will actually shake the milk in his higher dilution only fifty times (once before diluting and once afterward) while the other laboratories will shake it seventy-five times.

In studying the table, it will be seen that the greatest variations occurred in plating the raw milks, both in regard to the comparison of the different plates of the same dilution and in respect to the serial diminution from one dilution to the next.

While this series is a small one, yet parts of the table would indicate that it is perfectly possible to get results that compare reasonably closely, when the nature of the test is taken into account, and also that, when the plates are not too highly seeded and free from spreaders, the various dilutions can be expected to agree quite closely.

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ADVERTISING AS A FORCE IN PUBLIC HEALTH EDUCATION.

JULES SCHEVITZ,
Executive Secretary, Oklahoma Tuberculosis Association.

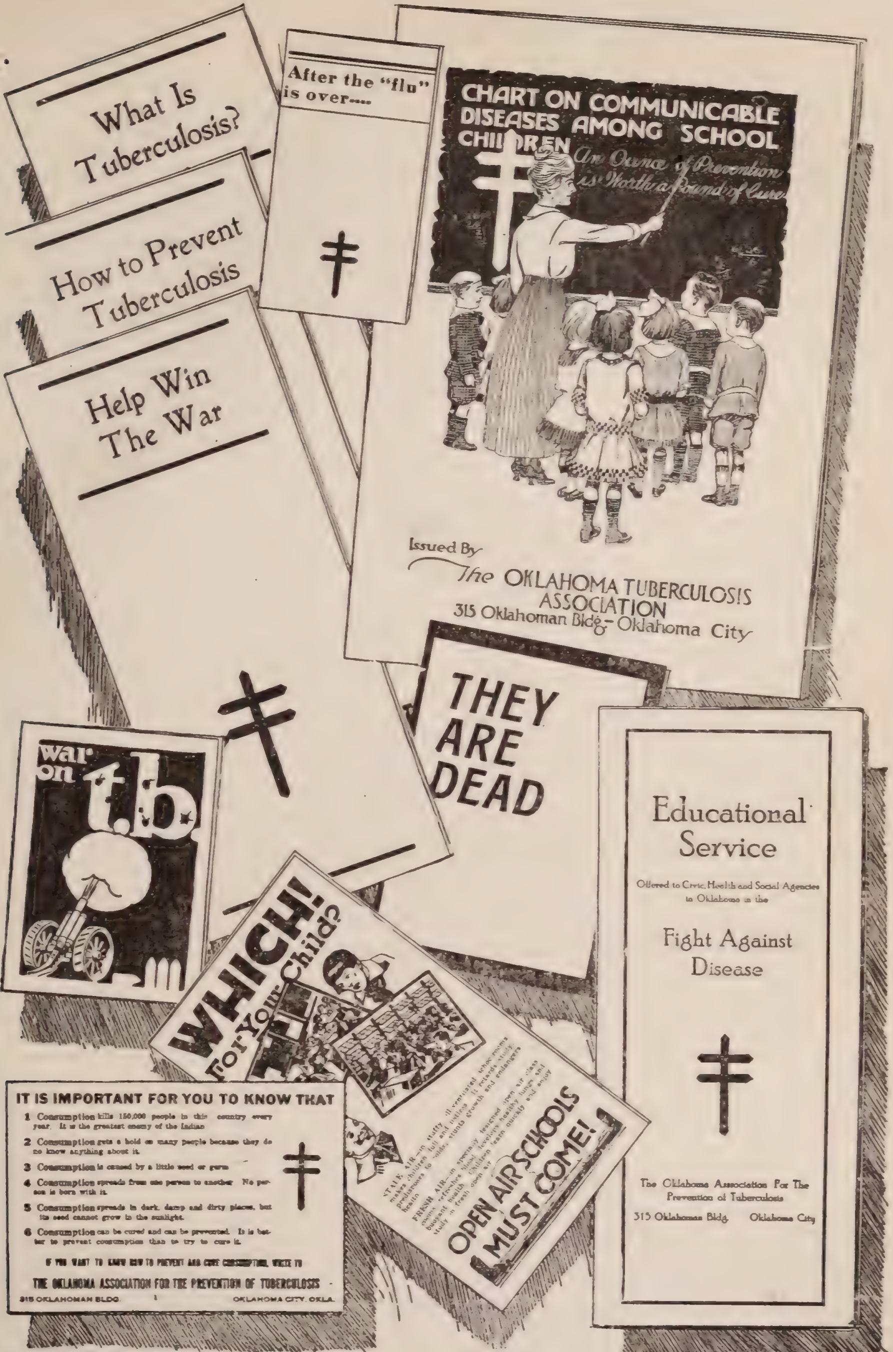
ONE form of health education, hitherto but little employed and one which presents wide possibilities for effective work, is the use of display advertising in the newspapers. No matter what the form of our educational material, we should employ the most modern advertising principles in its preparation. Our educational campaign is essentially a selling campaign, the article we offer for sale being health. It is by the use of sound advertising, including display advertising, that we can make our success as marked as that enjoyed by any well conducted commercial enterprise.

The experience of the Oklahoma Tuberculosis Association in advertising campaigns, though limited, tends to bear this out. One case in point is the experience of the Association in arranging for the annual meeting and state public health conference held on September 24, 1918. The Association is just one year old and because of its youth and very limited staff and the newness of the work in the state, its direct connections in the state by means of local associations and committees are rather few. It was considered very desirable to hold a meeting of a large number of representative people from all over the state, to interest them in the tuberculosis and general public health problems, and also to acquaint them with the work of the Association during the past year and with the plans for the future. To bring out a large attendence the following publicity measures were employed:

For two full weeks before the conference, stories, about the meeting appeared in all of the large daily papers in the state and in about 100 weekly papers. The larger papers featured the stories with almost as much emphasis and space as they would in preparing for a Red Cross or Liberty Loan campaign. These stories, which were real, live news stories, appeared almost daily; editorial comment about the work of the Association and the importance of attending the meeting was frequent. In addition the Association used display advertising copy in the larger dailies throughout the state. The people would read the news stories day after day and while they might pass them by at first, they became more interested as the time of meeting drew nearer, and as the stories were supplemented by appealing editorials and clever advertisements.

In order to reach certain individuals and organizations the Association sent out personal invitations with enclosed return cards in specially designed envelopes, all of which were prepared by advertising experts. The invitation in the form of a folder printed in two colors contained a facsimile letter from the governor emphasizing the importance of the work such as we are engaged in, and calling upon every county in the state to send representatives to this meeting. To clinch the matter and to make sure that certain persons whom it was particularly desirable to have present would come to Oklahoma City for the meeting, the Association printed an attractive certificate which the governor signed and sent to numerous persons, making them official delegates of the state, to attend this important health meeting.

The result of this intensive educational campaign was that about two hundred


What Is Tuberculosis?
How to Prevent Tuberculosis
Help Win The War
After the "flu" is over....
CHART ON COMMUNICABLE DISEASES AMONG SCHOOL CHILDREN
An Ounce of Prevention is Worth a Pound of Cure
Issued By The OKLAHOMA TUBERCULOSIS ASSOCIATION
315 Oklahoman Bldg.- Oklahoma City
THEY ARE DEAD
war on t.b.
Educational Service
Offered to Civic, Health and Social Agencies in Oklahoma in the
Fight Against Disease
The Oklahoma Association For The Prevention of Tuberculosis
315 Oklahoman Bldg. Oklahoma City
WHICH! For Your Child?
OPEN AIR SCHOOLS MUST COME!

STALE AIR—in stuffy, ill-ventilated schoolrooms makes children dull and listless. It retards study, predisposes to colds, stunts growth and endangers health.

FRESH AIR—in specially designed open air class rooms refreshes blood, develops healthy lungs and buoyant health. Children learn quickly and enjoy study in fresh open air.

IT IS IMPORTANT FOR YOU TO KNOW THAT

1 Consumption kills 150,000 people in this country every year. It is the greatest enemy of the Indian
2 Consumption gets a hold on many people because they do no know anything about it.
3 Consumption is caused by a little seed or germ
4 Consumption spreads from one person to another. No person is born with it.
5 Consumption spreads in dark, damp and dirty places, but its seed cannot grow in the sunlight.
6 Consumption can be cured and can be prevented. It is better to prevent consumption than to try to cure it.

IF YOU WANT TO KNOW HOW TO PREVENT AND CURE CONSUMPTION, WRITE TO

THE OKLAHOMA ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS
315 OKLAHOMAN BLDG. OKLAHOMA CITY, OKLA.

FIGURE 1—The services of leading advertising experts and artists were employed in the preparation of the educational material reproduced above. Accurate information in attractive form has been our aim throughout. The literature is profusely illustrated with original drawings and is printed in two colors.

delegates from every part of the state came to attend the meetings. They were as sincere and as representative a group of workers as gathered at any meeting and the enthusiasm and interest aroused as a result of two live sessions have given the Association new leaders and additional health educators to carry on our propaganda in places where we had never worked before. Samples of the publicity and advertising material employed in this drive are given herewith.

Another example of the Association's experience in the use of advertising methods in its educational campaign, is the display of lantern slides in the moving picture theatres of the state. Between films, the patrons of the show are waiting for diversion, and shrewd advertisers everywhere are taking advantage of this opportunity to give their message to the people through catchy slides. If such a method has any value in helping the sale of commodities like clothes, coffee or furniture, can it not have a similar value in health sales campaigns?

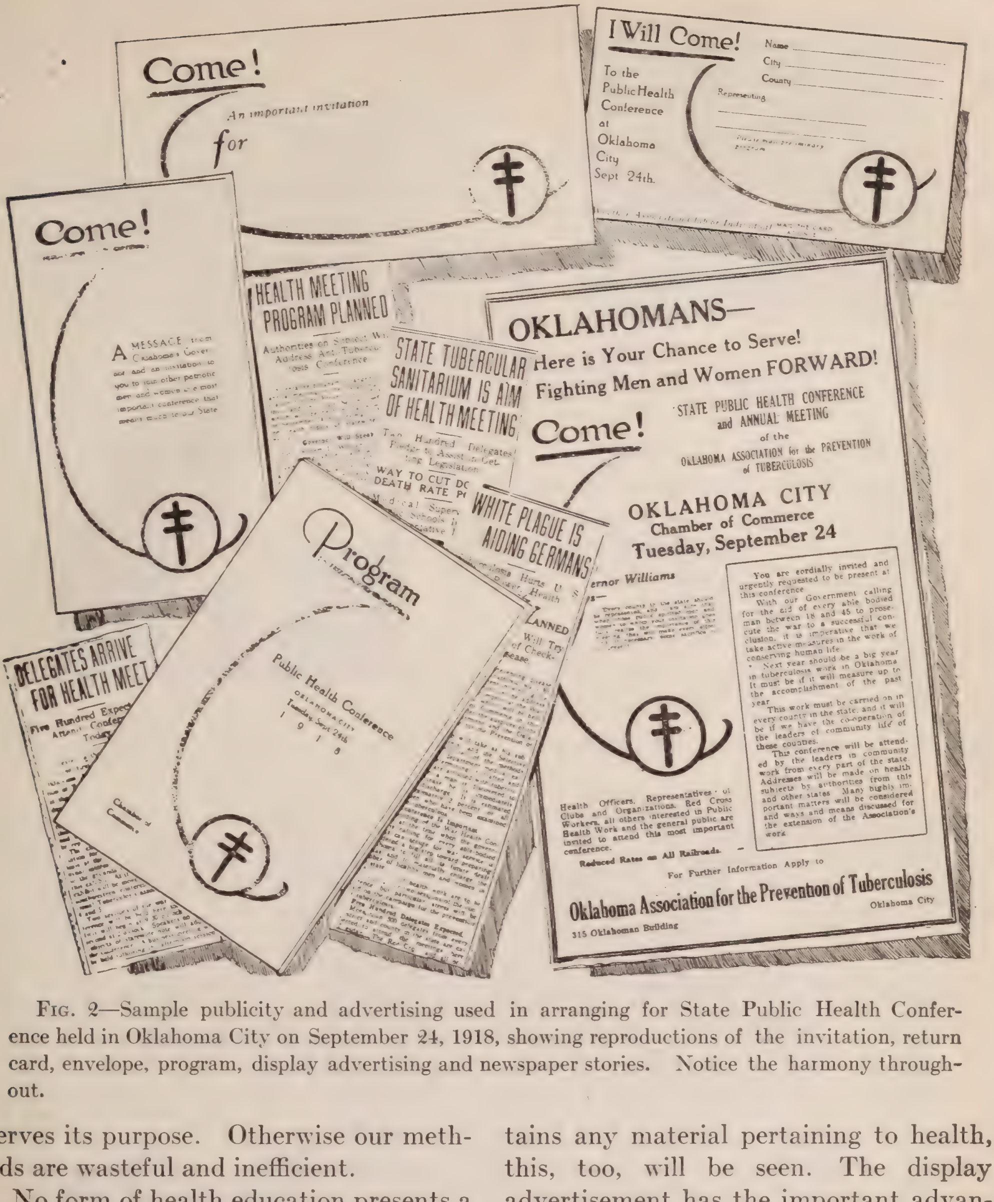
With this in mind the Association prepared a series of twelve colored slides, carefully and pointedly portraying the facts concerning tuberculosis and the best means of combatting and preventing it. It was necessary that the propaganda should not only be truthful, but what is more important, that it must be attractive, catching and if possible, entertaining.

Letters were sent to the two hundred and twenty-five moving picture theatre managers of the state enclosing a circular containing drawings and descriptions of the slides, asking them to reply if they would be willing to show the slides, one each week for a period of twelve weeks. In this letter an appeal to the state pride and patriotism of these men was made, and as a result of this bit of mail advertising, more than one hundred fifty managers offered to display the slides under the conditions outlined by the Association without any charge. Taking into account the theatres which were not operating, any more, it appears that the Association received favorable replies from 75 per cent of the persons canvassed. Any commercial advertiser will testify that no matter how successful his mail advertising might be, these results were from ten to fifteen times as effective.

The lesson of all this is, that by the display of the lantern slides the Association is handing out important health lessons to the people in more than one hundred towns in the state at the same time, and it is doing this every day for a period of three months. Assuming that the average patron goes to the threatre once a week, at the end of three months he will have received a complete course on the nature and prevention of tuberculosis, in accurate but sugar-coated form. Advertising representatives inform us that this generosity of the moving picture theatre managers in Oklahoma represents a saving of from $4,000 to $5,000 to the Association for the same amount of educational work done by this method.

The whole venture, including the cost of the preparation of the drawings, all of which were original and revolved about one central idea, together with a set of slides for each theatre, cost the Association less than $500.

In the conduct of an educational campaign it is essential to keep in mind at least three points. First, the material must be so designed that it will contain truthful information in attractive form; second, it must be so distributed that it will reach large numbers of people; and third, the distribution must be of such a nature that it will reach these persons at a time when they are in a mood to receive our message. If these three conditions are fulfilled our educational material



Come!
An important invitation
for

I Will Come!
To the Public Health Conference at Oklahoma City Sept 24th.
Name
City
County
Representing
Please mail preliminary program

Come!
A MESSAGE from Oklahoma's Governor and an invitation to you to join other patriotic men and women in a most important conference that means much to our State

HEALTH MEETING PROGRAM PLANNED

STATE TUBERCULAR SANITARIUM IS AIM OF HEALTH MEETING

WHITE PLAGUE IS AIDING GERMANS

DELEGATES ARRIVE FOR HEALTH MEET

Program
Public Health Conference
Oklahoma City
Tuesday Sept 24th
1918

OKLAHOMANS—
Here is Your Chance to Serve!
Fighting Men and Women FORWARD!
Come!
STATE PUBLIC HEALTH CONFERENCE
and ANNUAL MEETING
of the
OKLAHOMA ASSOCIATION for the PREVENTION of TUBERCULOSIS
OKLAHOMA CITY
Chamber of Commerce
Tuesday, September 24

ernor Williams

You are cordially invited and urgently requested to be present at this conference.

With our Government calling for the aid of every able bodied man between 18 and 45 to prosecute the war to a successful conclusion, it is imperative that we take active measures in the work of conserving human life.

Next year should be a big year in tuberculosis work in Oklahoma. It must be if it will measure up to the accomplishment of the past year.

This work must be carried on in every county in the state, and it will be if we have the co-operation of the leaders of community life of these counties.

This conference will be attended by the leaders in community work from every part of the state. Addresses will be made on health subjects by authorities from this and other states. Many highly important matters will be considered and ways and means discussed for the extension of the Association's work.

Health Officers, Representatives of Clubs and Organizations, Red Cross Workers, all others interested in Public Health Work and the general public are invited to attend this most important conference.

Reduced Rates on All Railroads.

For Further Information Apply to

Oklahoma Association for the Prevention of Tuberculosis
315 Oklahoman Building
Oklahoma City

FIG. 2—Sample publicity and advertising used in arranging for State Public Health Conference held in Oklahoma City on September 24, 1918, showing reproductions of the invitation, return card, envelope, program, display advertising and newspaper stories. Notice the harmony throughout.

serves its purpose. Otherwise our methods are wasteful and inefficient.

No form of health education presents a more perfect combination of these three fundamental elements than does display advertising in the newspapers. Nowhere can health education be more attractively displayed, more widely and more opportunely spread than through display advertising. The newspaper is the most widely used medium for obtaining information. People read newspapers to become informed and if the paper contains any material pertaining to health, this, too, will be seen. The display advertisement has the important advantage over the news story and the special article, in that it possesses the qualities of novelty, attractiveness and cleverness while the others are most often dull, and lifeless and frequently unattractive.

The injection of advertising methods, whether it be in the preparation of a pamphlet, the construction of an exhibit, the arrangements for a meeting or the conduct of a health legislative campaign,

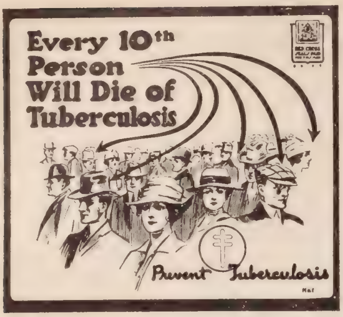

Every 10th Person Will Die of Tuberculosis
Prevent Tuberculosis

FIG. 3—The brief statement of a fact of vital importance. (Lantern slide.)

will increase manifold, the efficacy of our present campaign. This policy has been consistently observed by the Oklahoma Association and the results obtained warrant the efforts and funds expended. It is likely that because of the particular efforts in this direction, the exhibit material, the lantern slide series, the various forms of literature and the publicity methods employed by the Oklahoma Tuberculosis Association are as effective and as productive of good returns as will be found anywhere in this country. The Association was less than sixty days old when it found itself in the thick of a Red Cross campaign and without a staff and without any agents it was possible to raise the sum of $40,000, an increase of more than 2,000 per cent over the sale of any previous year. The Association believes that the remarkable success of that was due to the sound advertising methods employed.

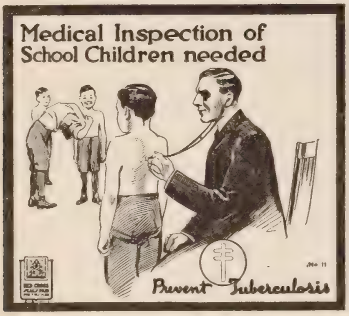

Medical Inspection of School Children needed
Prevent Tuberculosis

FIG. 4—An effective means of safeguarding the man-power of the future. (Lantern slide.)

The use of advertising in health campaigns is by no means new. To control the undue prevalence of smallpox in Kansas City, Kans., about five years ago, the local health department resorted to the use of advertising or bill boards. Hundreds of posters illustrating the disease in its worst form and urging vaccination as a preventive were utilized. The city schools were also placarded. In Kansas City, Mo., street cars, cards were used for the same purpose. Probably every health worker is familiar with the excellent advertising used by the Bureau of Public Health Education of the New York City Health Department. Their methods include the use of posters, street car

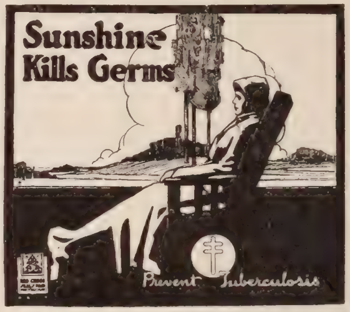


FIG. 5—Nature's remedies; fresh air and sunshine graphically portrayed. (Lantern slide.)

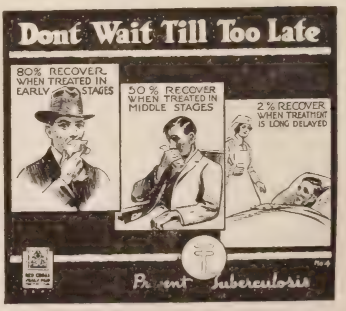

Dont Wait Till Too Late
80% RECOVER WHEN TREATED IN EARLY STAGES
50% RECOVER WHEN TREATED IN MIDDLE STAGES
2% RECOVER WHEN TREATMENT IS LONG DELAYED
Prevent Tuberculosis

FIG. 6—A vivid picture decrying the danger of procrastination. (Lantern slide.)

display and advertising in the newspapers. Whenever an epidemic occurs in a community the board of health almost always adopts such forms of publicity.

Health workers are not the only ones outside of the business men, who are appreciating the place of advertising in educational and sales campaigns. Philanthropic organizations like the Y. M. C. A., War Camp Community Service and the churches, are employing propaganda advertising as never before. Surely the results justify the cost.

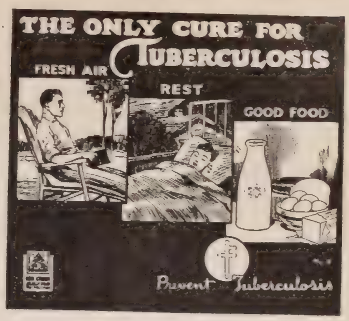


FIG. 7—The three fundamental principles in tuberculosis. (Lantern slide.)

No attempt has been made to consider the financial problem involved in the various forms of health education, not because its importance is not realized but rather because limited time will not permit me to enter into such a discussion. From the experience of the Association there seems to be no doubt that the actual amount of education resulting from $1,000 worth of advertising, this term being used in its broad sense, to $1,000 worth of education as handed out at present, would prove far superior and more economical.

As the situation exists today, the medical quacks and medicine fakirs have monopolized the field of public health advertising too long. It is time that we who are truly interested in the welfare of the people, took the field.

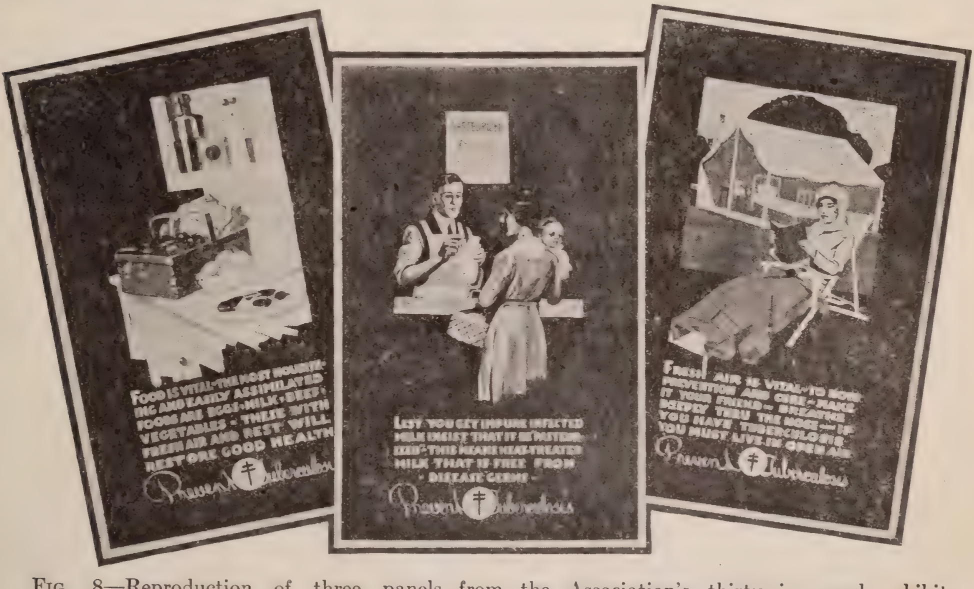

FOOD IS VITAL—THE MOST NOURISHING AND EASILY ASSIMILATED FOODS ARE EGGS-MILK-BEEF-VEGETABLES - THESE WITH FRESH AIR AND REST WILL RESTORE GOOD HEALTH
Prevent Tuberculosis
LEST YOU GET IMPURE INFECTED MILK INSIST THAT IT BE PASTEURIZED—THIS MEANS HEAT-TREATED MILK THAT IS FREE FROM DISEASE GERMS
Prevent Tuberculosis
FRESH AIR IS VITAL TO BOTH PREVENTION AND CURE—MAKE IT YOUR FRIEND—BREATHE DEEPLY THRU THE NOSE—IF YOU HAVE TUBERCULOSIS YOU MUST LIVE IN OPEN AIR
Prevent Tuberculosis

FIG. 8—Reproduction of three panels from the Association's thirty-six panel exhibit. Each panel is hand painted and beautifully colored and illustrates but one central idea. Note the slogan "Prevent Tuberculosis" on each panel.

◆

A RAPID METHOD FOR THE IDENTIFICATION OF BACTERIA FERMENTING CARBOHYDRATES.*

J. BRONFENBRENNER, PH. D., and M. J. SCHLESINGER.
(From the Department of Preventive Medicine and Hygiene, Harvard Medical School.)

To be read before the Laboratory Section, American Public Health Association, December 9–12, at Chicago, Ill.

THE importance of early detection of pathogenic bacteria in the stools of carriers or of individuals showing symptoms of intestinal infection is well recognized, and for this reason the bacteriological examination of excreta has become one of the daily duties of bacteriologists engaged in public health work. The method of isolation of pathogenic members of this group is based on their inability to ferment lactose. However, while the non-pathogenic members of the group usually produce acid on media containing lactose, there is quite an appreciable difference in the rate of this reaction in individual strains. Quite frequently one encounters in feces strains of B. coli which ferment lactose remarkably slowly; occasionally, the first signs of fermentation may appear only after several days of growth on media containing lactose.† It is evident that some of these strains may be "picked up" in the process of isolation of suspicious colonies from the lactose agar plate. While such errors are eventually corrected in the process of identification of strains thus selected, this procedure involves considerable expenditure of time and material. It is evident, therefore, that a method which would permit early and efficient elimination of slow lactose fermenters would be of practical value, especially where a great volume of work is involved. In our search for "carriers" in connection with the study of causes of food poisoning, a great number of specimens had to be examined. Further, since the number of pathogenic bacteria would be comparatively small even in the specimens in which they are present, it was thought advisable to identify as many suspicious colonies as time permited. It is thus that we developed a technique which early excludes the majority of late lactose fermenters "picked up" from the Endo-plate. On account of the simplicity of the method, it permits one to examine every suspicious colony on the plate without the expenditure of much time. The method consists in planting each of the suspected colonies into an agar drop, thus permiting a comparatively large number of bacteria to grow in a very circumscribed area, thereby sharpening the reaction. Under these conditions we frequently noted the appearance of acid after four to six hours of incubation in colonies, which showed no trace of acid on Endo-plates even after forty-eight hours. Moreover, if the drop cultures are permitted to grow twenty-four to forty-eight hours, it is possible to eliminate a number of slow fermenting strains of B. coli which produced acid on liquid lactose media after only eight to ten days.

The technique is as follows: One prepares medium containing 1.5% of agar, 0.5% of sodium chloride, 1% of peptone; this mixture is brought to boiling and the reaction is not adjusted. At this point, a suitable quantity of indicator is added,* the medium is distributed into small tubes containing 1 or 2 cc. of medium in each, autoclaved for twenty minutes at fifteen-pound pressure and stored on ice. When needed for use, this medium is melted and 0.1 or 0.2 cc. of 20 per cent lactose solution is added to each tube, thus obtaining a 2 per cent concentration of the carbohydrate. While hot, this lactose agar is deposited in drops by means of a sterile capillary pipette on the inner surface of the bottom of a petri plate. The drops can be placed very symmetrically and regularly if the outside of the petri plate is previously marked to show the points at which the drops are to be deposited. Each drop is inoculated with the material from individual suspected colonies, leaving two drops on each plate uninoculated to serve as controls of the original color of the medium. When all the drops are thus inoculated, one places a fresh drop of the same lactose agar over each one of the primary drops, thus securing the conditions of slightly lowered oxygen tension, favorable for the carbohydrate metabolism of bacteria. Care must be taken, of course, in placing the agar drops over the inoculated surfaces not to infect the end of the pipette. Another useful precaution is to make the drops as small as possible and spread the culture over the whole surface of the drop. This increases the sharpness of the reaction, as it tends to concentrate the action of acid produced by a great number of bacteria over a small area. Since CO_2 and some of the other acids produced by bacteria are volatile, the atmosphere of the petri plate soon becomes saturated with these acids which may partly diffuse into the other drops and affect the color of the agar and so confuse results. We found it possible to obviate this difficulty by inverting the plate and placing within its cover a circular piece of filter paper soaked in 2 per cent NaOH solution. Besides neutralizing the volatile acids, this moist paper helps also to keep the agar moist for at least eighteen to twenty-four hours. If it is desired to incubate the plates for a longer period of time, it is advisable to incubate the plates within the moist chamber. In our own laboratory a large specimen jar with moist cotton in the bottom of it serves the purpose. In a number of colonies, the fermentation of lactose is shown as early as four to six hours by the turning of the color of the indicator. However, a large number of colonies may ferment lactose more slowly and the acidity appears only after eighteen to twenty-four hours. In a comparatively few cases the acidity may appear considerably later.

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* This work is a part of the investigation of food poisoning, conducted under the direction of Dr. M. J. Rosenau, Professor of Preventive Medicine and Hygiene, Harvard Medical School. The investigations are done under the auspices of the Advisory Committee on the Toxicity of Preserved Foods of the National Research Council, and under a grant from the National Canners Association.

† Bronfenbrenner and Davis: Journ. Med. Research, September, 1918.

* While litmus or any other indicator can be used, we find it especially convenient to use CR indicator, described by us in the September issue of the *Journal of Medical Research*, 1918.

Since the agar layer over the growth is very thin, the carbonic acid produced diffuses without breaking up the structure of the drop, and for this reason the method does not permit of direct diagnosis of gas formation. When desired, it is possible to detect gas formation by the use of sterile hollow-ground slides instead of drops on petri plates. In this case, instead of making a drop, one fills the hollow of the slide with the lactose-agar prepared exactly as stated above, and after having inoculated it by means of a platinum needle, one places a cover glass over it, having previously sterilized it over a flame. In cooling, the agar makes a seal and in such a sealed cell both the acid and gas are easily demonstrable. However, since lactose is not fermented by the pathogenic members of the colon-typhoid group (with the exception of B. dysentery Rosen) it is safe to assume in almost all cases that drops turning acid indicate the presence of the non-pathogenic members of the group, and therefore, the recurrence to the use of hollow-ground slides may be avoided. As for the colonies not showing formation of acid in twenty-four hours, as stated above, a certain number may still prove on further analysis to be B. coli, but their number is considerably decreased.

EDITORIAL SECTION

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TUBERCULOSIS AND NOTIFICATION.

At a recent Boston meeting, Dr. Eugene R. Kelley, health commissioner of the Commonwealth of Massachusetts, called attention to the world-wide increase in tuberculosis. This is a phenomenon of great interest and of much consequence, the more so since the reasons for it are not clearly understood.

It has the more interest since there have been established in so many places leagues or societies combatting the disease. In this connection there is an interesting phenomenon, with reference to the decline in the mortality rate from this disease and the societies. In some places the associations, perhaps with the idea of securing more funds for the good work, have taken all the credit. To an extent this is the case of the fly which sat on the ox's horn and said, "What a great dust I am making."

Students of the graphic curves of tuberculosis are well aware that, ten or fifteen years before there was any anti-tuberculosis society in the world, there had begun a marked decline in the mortality curve of the disease. The associations and the boards of health have accomplished splendid things but there was some natural condition, not much discussed, which was giving its aid to the betterment of the health of man. Natural aids are never to be despised and natural conditions of dissemination will continue to spring their surprises, as indeed the outbreak of influenza-pneumonia has done so recently.

There seems to be without question a condition extending through civilized lands, favorable today to the spread of tuberculosis. No one has described it yet it exists. One phase has been expressed in the fear that returned prisoners from German soil, coming to their home towns in France, would be heavily infected. One of the most praiseworthy movements of the age has been the notable manner in which the International Health Board and the Red Cross have joined hands with the municipalities of France, and more recently of Italy, in the campaign of health education which has had tuberculosis and infant mortality for its targets.

In this country there will shortly be demobilized hundreds of thousands of men from over seas and from the camps. It is true that before discharge they will be examined by experts in order that their precise physical condition may be recorded. No one will know, however, to what extent their resistance may be impaired, for this may not always be determinable. In their home towns, with a return perhaps to occupations aloof from fresh air, no one can say what may be the future outcome.

There are, however, two safeguards neglected by our citizens oftentimes, but within the bounds of possibility—medical inspection and notification. Medically speaking we are a nation of happy-go-lucky sea captains, who never sound the wells till the crew reports water in the hold. We seldom inspect our bodies until we feel that something serious is the matter. Watchfulness and care of ourselves, with frequent surveys by the family physician, is a doctrine of public education that this country sadly needs. On the other hand early notification is a most important factor in the warfare against disease. The proper recognition of the value of notification is growing in this country, but alas, how slowly. With only one third of the country sufficiently interested in vital statistics to furnish to the government accurate figures of the birth-rate, there is little wonder that notification lags. But physicians should rally to the good cause and see to it that their districts are furnished with reliable figures concerning the incidence of communicable disease. With this information in hand the health officer has a basis on which to work. He has the symptoms and with these will be able intelligently to apply the remedy.

FIRST AID COURSES AND AMERICA'S WELFARE.

How often we hear the question asked—"And what good is it going to do you to take a course in 'first aid nursing' now that the war is over?" Usually the scoffer is easily convinced that nothing is wasted when a girl or woman or man takes the hours from a busy life to go through a series of lessons in health preservation, but few people think of the vast good that has been accomplished in America by these classes, aside from any that may ever come should the nurses be called for in emergencies.

These classes are teaching the women and men of America how to make their homes better fitted for health conservatories. Women who left their school days behind them before physiology was a part of the equipment, women who never did study anyhow, and women who may have come to our shores without the knowledge of American ways and methods,—they all are glad to take this course in "first aid" for it has become the popular thing.

The first lessons of the course, which the Red Cross has prepared, deal with disease, its cause and prevention. Then follow the lessons on the care of the house, of the ice chest, of water, ventilation, fires, lighting and sewage. These are vitally interesting to every woman, especially to the woman whose slender income makes it necessary for her to understand how best to care for the needs of her family. There are lessons in bedmaking. Then comes the care of the sick, thus fitting the women to take the responsibility of caring for those of their own households who may be ill without calling upon the graduate nurses who are so needed overseas or in time of epidemics. It also means the conservation of the family's money, for the trained woman can thus care for her own family without the expense of the trained nurse.

Classes are conducted in a business-like fashion and on graduation, if the student has attended 80 per cent of the lessons and has passed the examination with a standing of not less than 75 per cent, a certificate is granted. Those who wish to qualify as nurses' aids may enroll after securing this certificate.

But in the case of those who fail to secure the required number of points or who have missed some of the lessons, the value of the few that they may have attended is great. The proper making of a bed, the selection of proper bedding when the supply is to be replenished, the proper ventilation of a sick room, the ability to make a bed without making the patient uncomfortable,—all these mean that the women of America will be more efficient homemakers than they were before.

Men are being enrolled in special classes in many cities, and in many factories regular lectures on the preservation and conservation of health are a stated part of the program. Men are getting to where they feel that it is not a mark of distinction to be sick—that to be sick means to have broken some law of nature, and they are guarding more carefully against these occurrences which were formerly quite usual.

The work of the American Red Cross on the battlefields has been wonderful, its work among the refugees and the repatriés is hardly less so, the Home Service Section is doing splendid work among the families of the soldiers who have gone abroad, but little has been said of the remarkable work in this line of first aid nursing and its benefit to the homes and health of America.

Epidemics and preventable diseases take a greater toll of life than war. Up to December, 1917, Canada's toll in the war was 15,766 but in the same period Canada lost 22,560 men, women and children from six preventable diseases—typhoid, diphtheria, scarlet fever, whooping-cough, tuberculosis and measles,—preventable diseases that strike at children and at men and women in the most productive period of life. In addition to this there is an enormous waste of life from preventable infant mortality, and from occupational diseases, and also there are the illnesses which do not kill but which leave their victims with impaired efficiency. It may thus be appreciated that the sum total of vital waste is far greater than on the battlefield.

So, as the students go from the classes into their homes it is hard to overestimate their influence in the promotion of public health.

At this time the classes in first aid, and in fact all branches of Red Cross activity are interested in the Christmas Roll Call, which begins on December 16 and continues for a week. During this period an opportunity is given for those interested to enroll in this world-wide club, which not only cares for the men at war, for their families, for the refugees and repatriés, but which is trying daily to make better, more wholesome, the life in our own homes, to prevent the ills to which the flesh is supposed to be heir, but which have been proven to be among the "non-essentials."

SOME ASPECTS OF THE HOUSING PROBLEM.

Boston has just had a housing conference, and the question has been considered from a great many points of view. There are some incidental factors to the problem that may not occur to everyone on first consideration, and one of these is the education that should go with better conditioned tenements. There is no joke in the old story of the family which used the bath-tub for the storage of coal, such things are too often sober reality.

Birkenhead has been doing practical things in the way of housing improvements, and the report of its health officer, Doctor Marsden, makes interesting reading and furnishes food for thought. In the improvement of slums by wiping them from the face of the earth, some consideration must be given to those who lived in them. These persons are in two distinct categories, those whom vice and dissipation have brought down to this level and those whose condition is through misfortune. There are many honest and worthy people among the very poor.

The Birkenhead project has had to do with the latter and appears to be a well considered effort. One of the interesting developments is the furnishing of a central water heating system for each block of tenements. The argument of Doctor Marsden is that it is useless to provide a bath-tub for those who must heat their water on the kitchen stove, for they could not make use of it, and again, hot water is necessary for dishwashing and for properly cleansing the house. Without such necessities, the families, even in tenements initially clean would speedily fall away into their old bad habits. Hot water is piped to these homes, therefore, just as is the cold water supply.

One of the features of the Birkenhead experiment is the conclusion that although the rentals will pay interest on construction, sinking funds, etc., it will be necessary to reckon the land a dead loss. Little encouragement for private capital.

EDITORIAL NOTES.

"Reconstructed milk" is one of the food products to which the war has given great stimulus. It is not in any way intended to furnish the supply in any country where there are cows conveniently near. The munition cities that were built in a day and without reference to the food supply of the country about them, have been the ones to be benefited. At Nitro, W. Va., there was established a city with a daily demand for milk of about 3,000 quarts. There was prospective danger to the children in the situation to say nothing of the inconvenience of their elders. The United States Public Health Service saw the opportunity for a very practical trying-out, and its report of the results is exceedingly satisfactory. Reconstructed milk is dried skimmed milk which for use is enriched by the addition of butter-fats and in the process of reconstruction the milk is pasteurized.

Bind in Pages VII and IX.

Recipients of the American Journal of Public Health are reminded that in binding their copies it will be well to include pages VII and IX of the Advertising Section since they have the paging of the various sets of Notes. These are not included in the Index.

Change in Date of Publication.

Beginning with Volume IX, the first number of which is to be issued in January, the date of issue will be changed so that it will be mailed to recipients on the fifth of the month.

ASSOCIATION NEWS

By the Secretary, A. W. Hedrich.

Placing the War Sanitarians in Peace Positions.—With the end of the war a great many splendidly trained sanitarians will return to us. One of the great drawbacks of the public health field has been the shortage of well-trained men. Communities which sought for full-time health officers could not always be able to find qualified candidates. Now, the men who protected the health of our soldiers so well are equally fit for civil life.

It is not possible to state accurately in what numbers and in what time these men will be demobilized. The public health profession should, however, prepare to welcome them into the ranks of public health workers.

The recent influenza epidemic has awakened the American public to the need of health protection. Consequently, with a supply of efficient sanitarians in view it becomes imperative to present immediately to the communities the opportunity that lies before them.

At a meeting in Washington, D. C., on November 16, the Executive Committee considered this subject in consultation with a representative of the Surgeon-General of the Army and with the Surgeon-General of the U. S. Public Health Service.

The Health Employment Bureau of the American Public Health Association is taking steps to acquaint the members of the Army Medical Corps with its Health Employment Service, which will be extended free to all returning war sanitarians.

Applicants for positions should file with the Bureau by filling out application cards concerning qualifications, minimum salary requirement, type of position desired, etc.

When the prospective employers write to the Bureau, the names and condensed information concerning all qualified candidates will be immediately forwarded—usually within twenty-four hours. It is essential that employers specify the salary which they are prepared to pay.

The Journal also carries free help-wanted advertisements and prospective employers are invited to make the fullest use of this privilege.

As fast as the sanitarians are registered in the Bureau it is planned on the other hand to conduct intensive propaganda among health departments and others who might require the services of health officers, school medical inspectors, laboratory workers, sanitary engineers, public health nurses, statisticians, industrial hygienists, etc.

The subject will also be considered by the Board of Directors of the Association at Chicago and announcements will be made thereupon.

⁂

HELP WANTED.

In order to help relieve the shortage of sanitarians due to the war free help-wanted announcements will be carried in this column until further notice. Copy goes to the printer on the fifteenth of each month. In answering keyed advertisements, please mail replies separately.

The Health Employment Bureau also sends lists of applicants to prospective employers without charge.

Veterinarian or food inspector in southern state. Salary, $150 per month. Address No. 179, W. D. H., care of this Journal.

⁂

The following have been elected to membership in the Association during November:

W. C. Sieker, Health Commissioner, Village of Shorewood, Milwaukee, Wis.

Clyde S. Jones, M. B., D. P. H., Bacteriologist, Chicago, Ill.

Frank W. Gilcrease, A. B., Water Analyst, N. Y. State Dept. of Health, Albany, N. Y.

Mary S. Bailey, M. D., Bacteriologist, Health Dept., Baltimore, Md.

Malcolm Dean Miller, A. B., M. D., Epidemiologist, Health Dept., Akron, Ohio.

Lily Owen Burbank, M. D., Boston, Mass.

L. D. Howe, M. D., Pres. Board of Health, Streator, Ill.

Sears, Roebuck & Co., Att'n Paul C. Fox, B. S., M. D., Chicago, Ill.

Charles L. Williams, M. D., P. A. Surgeon, U. S. Public Health Service, Macon, Ga.

W. L. Noble, M. D., Chicago, Ill.

Frank A. Metcalf, M. D., Chicago, Ill.

William A. Walker, Ph. C., State Chemist and Director State Board of Health, Oklahoma City, Okla.

Barbara Binks Drum, B. A., M. S., Instructor in Bacteriology, State College of Washington, Pullman, Wash.

Leslie C. Whittemore, S. B., Ass't Sanitary Engineer, Chicago, Ill.

Mahlon R. Kline, General Employment Agent, Philadelphia, Pa.

Irene Kaufmann Settlement, Pittsburgh, Pa.

J. Anna Norris, M. D., Director of Physical Education, University of Minnesota, Minneapolis, Minn.

August Sigmund Newmark, M. D., Chemist, First Aid Instructor, New York City.

E. C. Lindsey, M. D., Florence, Ala.

David Andelson, M. D., Chicago, Ill.

Andrew Nelson Wardle, B. S., Ass't San. Eng., W. Va. State Dept. of Health, Charleston, W. Va.

Mrs. E. P. Wanzer, Chairman of Red Cross Seal Committee of South Dakota, Armour, S. D.

Jane Van DeVrede, R. N., Bacteriologist, part-time, Atlanta, Ga.

Albert E. Brown, Captain M. C., Fort Riley, Kan.

David E. Beardsley, A. B., M. D., Cedar Rapids, Iowa.

Joseph Herzstein, B. S., M. S., Sanitarian, New York City.

Frank J. Sherman, M. D., Ballston Spa, N. Y.

Rudolf Wagner, M. D., Chicago, Ill.

Robert Hall Craig, B. S., Sanitary Engineer, Harrisburg, Pa.

John F. Beseler, M. D., Chicago, Ill.

Myer Marbel, M. D., Chicago, Ill.

Solomon L. Zeltner, M. D., Chicago, Ill.

W. Eugene Shelton, M. D., Inspector Food Bureau, Health Dept., Chicago, Ill.

George J. Dehn, Sanitary Engineer, Chicago, Ill.

C. Curtis Hudson, M. D., City Health Officer, Charlotte, N. C.

Frederick Epplen, M. D., Spokane, Wash.

Frank M. Huntoon, M. D., Bacteriologist, Glenolden, Pa.

Chester S. Kingsley, A. B., Resident Sanitarian, U. S. Shipping Board, Bath, Me.

Mrs. Saidie Orr-Dunbar, Exec. Sec. Oregon T. B. Ass'n, Portland, Ore.

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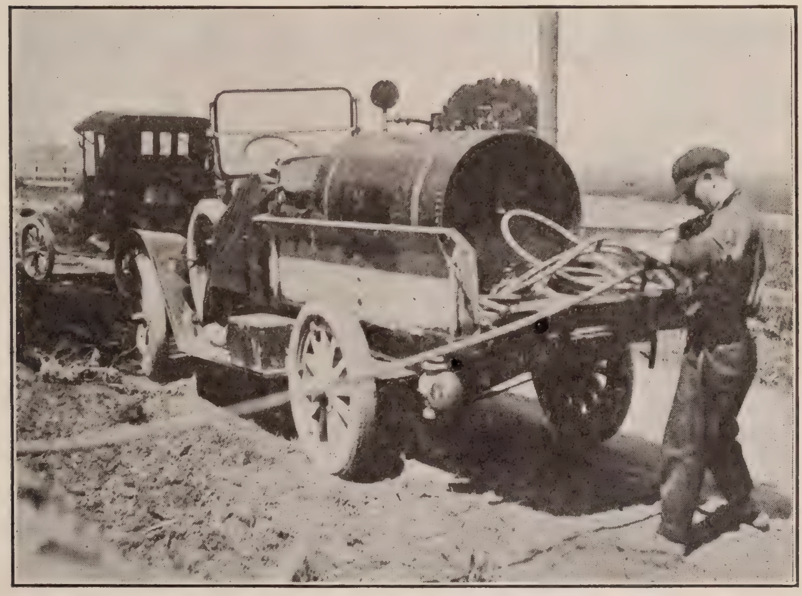
NEWEST ITEM IN CALIFORNIA OUTFIT.



California has added to the equipment of its State Health Department a new auto-oil-sprayer. This flexible machine is capable of covering a wide range of territory in minimum time. It is serviceable as a quick and effective means of "filming" water surfaces in the fight against malaria and for various other purposes in which oil-spray or oil may be used to advantage.

STORIES FROM THE DAY'S WORK

Our readers are invited to contribute to this section.—*Editor.*

A WEST VIRGINIA EPISODE.

As shown by the experience of the West Virginia State Department of Health, posters may not always accomplish the end sought. One poster on consumption that was distributed through all mining towns bore the statement, "Do not use patent medicines, they may contain alcohol and dope." A great many of the coal operators were forced to take black paint and obliterate this part of the poster. It was said in one mining town that the day after the health notice appeared on the telephone poles, coal tipples, etc., sixteen dozen bottles of "Tanlac" alone were sold to miners and that despite the fact that West Virginia is a dry state, there was more than one arrest for drunkenness. It may pay to advertise but certainly the remuneration was not for the State Health Department in this case.

Mayo Tolman,
Chief Engineer,
West Virginia Health Department.

⁂

ILLINOIS ADMINISTRATION VAGARIES.

The Health Officer of a town not far from Chicago called me to help him make a diagnosis in some cases of discrete smallpox. He and several doctors had made a diagnosis of chickenpox and had let the disease get under headway until they began to suspect a mistake. I met the Mayor who requested me to visit every suspicious case in the town. With the Health Officer I visited seventeen cases and had them all quarantined at home, as there was no hospital in which to isolate them. A warning placard was posted in each case.

That night the Mayor and members of the City Council got drunk. About 2.00 a. m., they ordered a carriage, went to each of the quarantined houses and pulled down the warning cards.

The next day, when the Mayor sobered up, he ordered the placards replaced. In this instance I was employed by the Health Officer and the Mayor, but inasmuch as the City Council had not authorized the Mayor to expend money, they refused to pay my bill.

It is rare that a Council will refuse to pay expenses incurred by the Mayor and Health Officer in an emergency, but some councils will do so. This is the only instance of such refusal in all my experience. It is a technicality to remember.

The main interest centered, however, in keeping the disease out of Chicago as the town was not far distant. I made a second visit to make sure there was some official besides the Health Officer who was keeping sober.

Herman Spalding, M. D.,
Department of Health, Chicago.

⁂

SAFETY FIRST.

He was no less a personage than a member of a foreign commission making the rounds of cities and cantonment zones in this country. His companion was a statistician of international fame, a doctor. A representative of the State Board of Health, a physician, accompanied them. Hot, tired, and dusty after a ride of sixty miles, they arrived at the only "soft" and "hard" drink establishment in that section of the river bottom. Naturally they wanted a drink, and hastened from the automobile to the little stand. The Proprietor, *sui generis,* held up his hands in holy horror—"Me no serve no drink to nobody with uniform." "We don't want beer, we want a drink of pop." "Me no serve pop, me no serve nobody in uniform. Get out of my place! Get out of my place!" "Won't you give us a drink of water?" "Me give nothing to uniforms, youse (pointing to the two civilians) may get drink, but me no give *him* no water, no nothing." Evidently the stand had been inspected, perhaps the uncompromising proprietor had been given warning to "clean up, or shut up."

Oscar Dowling,
Health Commissioner, Louisiana State Board.

⁂

SOME OLD-FASHIONED IDEAS.

The advent of the influenza epidemic brought to light many curious notions among supposedly intelligent people. Literally hundreds were to be found with a bag of asafœtida hung about their necks or a piece of camphor done up in a rabbit's fur in the vest pocket, or a bundle of horse hairs tied about the left arm. When questioned as to the efficacy, the "performer" always said that it worked when his grandfather was a boy and he didn't see why it shouldn't be just as effective now.

M. T.,
Charleston, W. Va.

BOOKS AND REPORTS REVIEWED

The Passaic Valley Sewerage Case.

The attention of sanitary engineers is once more directed to the Passaic Valley Sewerage case by the publication in five large volumes—4600 pages—of the proceedings of the Supreme Court of the United States, October term, 1916. Technically the case is known as "The People of the State of New York, Complainants *vs.* State of New Jersey and Passaic Valley Sewerage Commissioners, Defendants. It is an original case brought before the U. S. Supreme Court, that is, one not carried up on appeal.

It is the record of a suit instituted in 1908 at the instance of the city of New York to enjoin and restrain the discharge into upper New York Bay of the sewage and trade wastes of thirty-seven municipalities and townships in the Passaic Valley watershed in New Jersey. The amount of these wastes was estimated as over 360 million gallons a day. Reference is made to the investigations of the New York Bay Pollution Commission and the Metropolitan Sewerage Commission. Failing in efforts to secure coöperative aid from New Jersey the present suit was brought.

This article is not a review of the case, but of the report. In the first place let it be said that the testimony published is that of the complainant only. If one wishes to arrive at the merits of the case he must read the testimony of New Jersey, not here presented, as well as that of New York. The first three volumes contain the dreary stenographic record of the testimony of the witnesses, etc., and lawyers' arguments. No one not directly concerned with the case will care to read this record. Of course it contains valuable information, as one would naturally expect from the long list of eminent sanitarians who gave testimony, but for any practical use must be boiled down and summarized. Obviously the consensus of opinion of the witnesses for New York was that the discharge of sewage through the proposed outfall sewer from the Passaic Valley would be detrimental to the water of New York harbor and constitute an injury. This opinion was based on investigations of the present pollution of the harbor by the sewage of New York city and other bordering communities, the probable natural increase in such pollution, and estimates of the time when this increase, with and without the Passaic sewerage project, would result in producing a public nuisance. The various shades of opinion in regard to this matter are interesting to compare. Some experts looked at it from an analytical point of view, basing their opinion on detailed studies of dissolved oxygen, the number of B. coli in the water, and other well-known tests. Others regarded it as a matter of public policy; others spoke from experience elsewhere. In reading this testimony one cannot fail to notice how much of the opinion was based on probability and, in spite of the enormous amount of money and labor spent in the investigation, how difficult it is to obtain adequate comprehensive generalizations as to the essential facts necessary for safe judgment. One cannot study the sewage disposal problem of New York harbor without realizing its complexity, and the need of a master mind to organize the problem into a united whole.

The fourth and fifth volumes have great professional value for they contain the exhibits put in as evidence by the witnesses for New York. They are richly illustrated. Taking up these two volumes almost at random the following were the first reports which struck the attention of the reviewer. There is not space here to refer to all of them.

In Volume 4 there is an enormous series of tables of analyses of harbor water, with dozens of maps showing where the samples were collected. This work was done by the Metropolitan Sewerage Commission. These give the exact location of each sample, by latitude and longitude (degrees, minutes and seconds), the exact time of collection, the state of the tide, depth of sample, temperature of water, the per cent of land water (meaning in popular parlance fresh water), the dissolved oxygen expressed in cubic centimeters per litre and per cent of saturation. One may admire the enormous amount of painstaking work in all this, but at the same time must feel that these results would be more valuable if they had been carefully analyzed by the statistical method and stated in terms of the frequency with which certain conditions occur in each region where samples were collected. If these generalizations, other than those of averages, are made they are not conspicuous and have escaped the reviewer's attention. The same report contains the records of bacteriological tests of water samples and also analysis of samples of mud from the bottom of the harbor—all very interesting and very important. It also contains the two early reports of the New York Bay Pollution Commission made in 1905 and 1906. Even more interesting than the tables of analyses are the studies of tidal volumes and currents made by the Chief Engineer of the Metropolitan Sewerage Commission, Kenneth Allen. Colored diagrams are used to illustrate the seasonal changes in the salt and fresh water at various places in the harbor. In this study the water at ebb tide is divided into four classes: sea water which leaves the harbor not to return, sea water which will return, "land water" which will not return and land water which will return. The water at flood tide was divided into returning land water, returning sea water and new sea water entering the harbor for the first time. The diagrams are well prepared and exhibit the seasonal changes in a striking manner. These diagrams are on pages 3400 to 3422.

The fifth volume contains interesting studies of local pollution at various points along the river front illustrated with photographs. On page 3993 is a map of Boston harbor showing the extent of sewage pollution at the three main outfalls. On later pages we find accounts of the condition of the water at Harrisburg and Philadelphia, and at various harbors on the Atlantic coast,—such as Havana, Baltimore, Washington, Tampa, Savannah, Jacksonville, Charleston, made by D. D. Jackson, Theodore Horton, and N. S. Hill, Jr. An important study of the circulation of the water in the harbor, the absorption of dissolved oxygen by the water, the reaeration of water and the effects which these factors have on the location of sewer outlets by Gen. W. M. Black and Prof. Earle B. Phelps is given on pages 4019–4178. There is a general report on pollution by James H. Fuertes, reports on the pollution of oyster beds, scientific studies of the mixing of salt and fresh waters, and of copper in oysters. This serves to show the variety of subjects included in the reports.

Last, but not least, should be mentioned the reports of the Metropolitan Sewerage Commission, for a comprehensive plan of sewage disposal for the entire Metropolitan district. These plans make up a large part of Volume 5. Not one alone, but several projects are considered, the Metropolitan district being subdivided for the purpose. The most striking suggestion is that for the construction of a proposed outlet island, off Coney Island and Rockaway Beach on which would be located works for the treatment of the sewage of a part of New York before discharging it into the ocean. The members of the Commission were Dr. George A. Soper, Chairman, James H. Fuertes, H. deB. Parsons, Charles Sooysmith, and Dr. Linsley R. Williams. One result of the case here reported was an agreement and an approval of the plans proposed for the Passaic Valley trunk sewer under agreed conditions.

One cannot close even a brief review without referring to the zeal of Dr. George A. Soper, who has been at the head of the various commissions which have studied the great problem of the sewage disposal of America's greatest city. Although the problem has not been solved, studies such as those described in the report of this famous case have kept the subject prominently before the people and some day a great project or series of projects will be undertaken and carried through to completion.

George C. Whipple.

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Home and Community Hygiene. *Jean Broadhurst, Ph. D. Philadelphia and London: J. B. Lippincott Co., 1918. Pp. 428. Price, $2.*

One of the most difficult of tasks is to write a popular book on a scientific subject. Such attempts usually result in failure, but the above named book is certainly a success. When such a broad field is covered, as personal and public hygiene, the difficulty is greatly enhanced, because no one person can be thoroughly versed in more than a small part of the subject. This usually leads to ill-balanced treatment, or what is worse, to inaccuracy in statement concerning matters not immediately within the author's own province. Nothing is more common in the popular instruction in hygiene than to teach discarded theories which must later be unlearned. Professor Broadhurst has evidently kept well in touch with even the very latest progress in all lines of hygienic study. The book is certainly an exceedingly up-to-date exposition of sanitary science and practice. It is not only interesting to read, but is a handy book of reference to have in the family library. There are twenty-six chapters which are so arranged that each is fairly complete in itself. Besides the subjects usually found in such works like food, water, ventilation, disinfection, etc., are chapters dealing with laboratory tests for disease, with summer camps, the diseases of middle life, mental hygiene, a comparison of rural and urban health conditions, vital statistics and public health administration.

Charles V. Chapin.

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The Fringe of the Fight. *Col. George G. Nasmith, C. M. G., New York: George H. Doran Company.*

Many members of the American Public Health Association will fail to recognize in Col. George G. Nasmith, C. M. G., their old comrade, Dr. G. G. Nasmith, director of the laboratories, Toronto Department of Health, and active member of the Laboratory Section, A. P. H. A.

Chemists will find their chief pleasure in reading the "Fringe of the Fight" in the chapter dealing with the second battle of Ypres in which the first account of the use of poison gas is found. Doctor Nasmith saw the yellowish green cloud drifting across the field. "It looks like chlorine and I bet it is," said the doctor. The gas reached them and their eyes began to run water and became bloodshot. They decided that the gas was chlorine with perhaps some bromine. The next day he was summoned to General Rawlinson's headquarters to tell what he knew of the gas and what could be done to combat it. He advised the use of wet handkerchiefs until better masks could be provided. He recommended a mask saturated with hyposulphite of soda.

Sanitarians will be especially interested also in the methods of testing and sterilizing water and in the description of the operations of the mobile laboratory. *W. A. Evans, M. D.*

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Hygiene of the Eye. *William Campbell Posey, A. B., M. D., Ophthalmic Surgeon to the Mills and Howard Hospitals; Professor of Diseases of the Eye in the Philadelphia Polyclinic; Ophthalmologist at the University of Pennsylvania; Chairman of the Commission on Conservation of Vision of Pennsylvania. Philadelphia and London: J. B. Lippincott Co., Illustrated.*

This book is an exceptionally valuable one for all who are interested in public health education. It is written not for the specialist but for the family physician and the general public, and its style is remarkably clear and forcible. The illustrations are excellent, and add to its usefulness. For instance, there is a full page illustration which shows the common incorrect positions of eye-glass frames in a more vivid way than would pages of description. The chapters on wounds and injuries and on the education and employment of the blind are also made more interesting by illustrations which are models of clearness. We know of no book on the hygiene of the eye which gives as well in condensed and popular form the principles of the care of the eyes under the stress and strain of modern industrial life. The text describes the different ways in which accidents occur both at home and at work and gives suggestions towards possibilities of protection.

The author has wisely associated several authorities with him for certain specialities, for example, Herbert E. Ives, of the Illuminating Engineering Society, who writes of artificial lighting, and O. H. Burritt, of the Pennsylvania Institution for the Instruction of the Blind who discusses blindness from an economical and social point of view and the education and employment of the blind.

Doctor Posey takes a well balanced view which is neither unduly conservative nor unwisely radical as to the influence of ocular defects upon the general system, and he is not afraid to believe in the reflex origin of many symptoms of eyestrain. He also gives an excellent description of the participation of the eye in diseases of the other parts of the human body. But it is in his chapter on school life that he gives some of the most valuable lessons on hygiene of the eyes of children. He describes medical inspection of schools and advocates strongly the extension of special classes for children with defective vision as now carried out in various cities of the country.

In order to complete the survey of ocular hygiene the author has included a simple description of the commoner diseases and defects of the eye which will be of value to nurses and teachers as well as to general practitioners. *W. M. Carhart, M. D.*

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Principles of Bacteriology. *Arthur A. Eisenberg, A. B., M. D. St. Louis, Mo.: C. V. Mosby Company. Cloth, Pp.* 198. *Price,* $1.75.

This book is intended for a textbook for nurses. It is entirely up-to-date in the discussion of the subject and contains more or less detailed reference to the work of Cole and his associates on pneumonia, the recent work of Bull on the serum therapy of the gas bacillus, the complement-fixation test for tuberculosis, the Schick test, etc. The text is covered in three sections: I, "General Bacteriology"; II, "Special Bacteriology," while Section III takes up the diseases of unknown origin, bacteria of soil and air, water and milk and general care of the laboratory. The forty illustrations are technically correct and instructive. The book can be recommended to the nursing profession.

Arthur Lederer, M. D.

PUBLIC HEALTH NOTES

Abstracts by D. Greenberg, M. P. Horowitz and Mayo Tolman.

Reserve of the Public Health Service.—For some time it has been felt that the United States Public Health Service should have at its disposal a permanent reserve, on which it could draw in time of emergency such as that presented by the current epidemic of influenza. In the form reproduced herewith this resolution was agreed to by the House of Representatives on October 18 and by the Senate on October 21. It was formally approved by the President on October 27, 1918.

By far the larger part of the reserve to be organized under this act will be on active duty only during times of national emergency, though it will probably be necessary to establish periodic terms of training, so as to better fit the officers for such service. With the passing of the emergency these men will automatically go on the inactive list; always, however, subject to call to active duty by the Surgeon-General. Detailed plans for the organization, training, and assignment of the reserve officers are now under consideration.

"*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled*, That for the purpose of securing a reserve for duty in the Public Health Service in time of national emergency there shall be organized, under the direction of the Secretary of the Treasury, under such rules and regulations as the President shall prescribe, a reserve of the Public Health Service. The President alone shall be authorized to appoint and commission as officers in the said reserve such citizens as, upon examination prescribed by the President, shall be found physically, mentally, and morally qualified to hold such commissions, and said commissions shall be in force for a period of five years, unless sooner terminated in the discretion of the President, but commission in said reserve shall not exempt the holder from military or naval service:

"*Provided*, That the officers commissioned under this act, none of whom shall have rank above that of Assistant Surgeon-General, shall be distributed in the several grades in the same proportion as now obtains among the commissioned medical officers of the United States Public Health Service, and shall at all times be subject to call to active duty by the Surgeon-General, and when on such active duty shall receive the same pay and allowances as are now provided by law and regulation for the commissioned medical officers in the said regular commissioned Medical Corps. (Approved Oct. 27, 1918.)"—*Public Health Reports*, November 1, 1918.

(*D. G.*)

Public Health Administration in Rural Districts.—It is well known that public health administration in rural districts is not as thoroughly organized or as efficient as the health protection afforded in the larger cities. Rural health work presents great obstacles which are not present in the cities. One of the reasons why rural health work has lagged behind is due to the absence of a public health consciousness, or desire for modern sanitary practices in the country. It is the opinion of Dr. L. D. Bristol, Commissioner of Health for Maine, that this consciousness can not be awakened until a call for modern public health protection will be heard. To this end, he advises the study of rural sociology by competent, inspiring men in order first, to understand the prevailing conditions and the character of the rural resident. He would also educate the boys and girls at the State Agricultural Schools in hygiene and sanitation. At each of these institutions, extension courses in public health should be open to all rural residents, and an attempt should be made to bring the gospel of community health protection to the rural districts. Two or more adjacent towns should join together in order to employ a full-time, well-trained health officer, together with an adequate number of public health nurses. The laboratory facilities of the state should be so extended that additional laboratory units will be provided throughout the rural sections of the state. By means of these progressive measures, together with the general supervision, on the part of the State Health Department, effective health protection would be afforded in the rural portions of a state.—*Bulletin, Maine State Health Department*, August, 1918. (*M. P. H.*)

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Sewage Sedimentation Versus Five Screens.—After investigating the relative value of sewage treatment by Imhoff tanks and five screens, Harrison P. Eddy has come to the conclusion that it would be wiser and safer for the City of Cleveland to adopt Imhoff tanks in preference to fine screens. The Imhoff tanks will remove the large sewage particles as thoroughly as the screens, besides removing a large amount of finely suspended material which the screens will not affect. In this way, the Imhoff tank brings about a greater reduction of bacteria in the effluent, besides avoiding the formation of objectionable sludge deposits. There are three sewer outlets in Cleveland. For the sewage from two of these, Imhoff tank treatment and final disinfection are recommended. For the third it is urged that Imhoff tank treatment should be followed by trickling filtration. The objects of the treatment are to prevent bacterial pollution of bathing waters, and to avoid nuisances due to putrefying deposits of sludge. Cost figures are quoted for each process.—*Engineering News-Record*, October 31, 1918. (*M. P. H.*)

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Utilization of Vaccine for the Prevention and Treatment of Influenza.—At a conference on preventive vaccination for influenza, held at the War Office (England), the committee reached the following conclusions:

After discussing the available evidence as to the bacteriology of the present epidemic, the majority of those present were agreed that there was considerable doubt as to the primary etiological significance of the Bacillus influenzæ of Pfeiffer, and considered that the existence of some as yet undiscovered virus must be regarded as possible. The organisms most frequently associated with the B. influenzæ and in their opinion, chiefly responsible for the gravity of the secondary pulmonary complications, are pneumococci and streptococci.

It was agreed that in the preparation of a vaccine the three following organisms only should be employed, the Bacillus influenzæ, the pneumococcus, and the streptococcus. In each instance it was decided that a number of different strains and types of each organism should be utilized in the preparation of the vaccine, and that these strains should have been recently isolated from cases occurring during the present epidemic and should be submitted to strict tests as to race and type prior to use.

As to the relative proportions of the different organisms and the dosage of the vaccine, it was agreed that the following should be its constitution and dosage:

	First Dose.	*Second Dose.*
B. Influenzæ	30 millions	60 millions
Pneumococcus	100 millions	200 millions
Streptococcus	40 millions	80 millions

The vaccine should be sterilized by a temperature of 55 C. maintained for half an hour, and 0.5 per cent of carbolic acid should subsequently be added as an antiseptic. Whenever possible, both doses of the vaccine should be given at an interval of ten days.

As to the use of the vaccine in treatment of cases, it was recommended that (a) The vaccine is most likely to be of service in the treatment of subacute and of chronic cases; in this class of case the initial dose which they recommend is one-fifteenth of the "first dose," as detailed above; (b) The use of the vaccine in the treatment of severe cases of secondary broncho-pneumonia cannot at present be recommended, in view of the dangerous rapidity and severity of many of these cases. Should it, however, be desired to try the vaccine in such cases it is advised that the initial dose should not exceed one-twentieth of the "first dose."—*Lancet*, October 26, 1918, p. 565. (*D. G.*)

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Home Pasteurization of Milk.—It would be well for each state to prepare a special article on pasteurization of milk in the home for its health bulletin but let us have a full knowledge of what is correct and what is incorrect.

On page 93 of the *Minnesota Health Journal* for October 31, 1918, we read "Boil all Milk used in Infant Feeding," while on page 2 of the April to June bulletins of the State Board of Health of Wisconsin we find "Caution, don't let the milk boil." Some are bound to ask which is correct.

(*M. T.*)

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Birth Statistics in the Birth-Registration Area for 1916.—The Bureau of the Census, Department of Commerce, has recently published the birth statistics for the birth-registration area for 1916. This area includes Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, Maryland, Michigan, Minnesota and the District of Columbia. The estimated population of this area is 33,000,000 or about 32 per cent of the total population of the United States.

818,983 infants were born alive in 1916. This is equivalent to a birth-rate of 24.8 per 1,000 population. The total number of deaths in the same area was 486,682 or 14.7 per 1,000 population. The infant mortality rate was 101 per 1,000 living births. The birth-rate for 1916 was 0.1 of 1 per 1,000 population lower than for 1915, while the death-rate was 0.7 of 1 per 1,000 higher than for 1915. The infant mortality rate was lowest in Minnesota where the rate was 70. The highest infant mortality rate was found in Maryland where it was 121. This is due, however, to the large colored population in Maryland. The infant mortality rate for whites alone in that state was 101. New Hampshire, with an infant mortality rate of 115, would have the highest rate, if the colored element of the population in Maryland was not included. That the infant mortality varies with the nativity of the mother was clearly demonstrated again. The infant mortality rate among children from Danish, Norwegian and Swedish mothers was 68; from Polish mothers 148, and from negro mothers 184. The infant mortality rate among males was again higher than among females. Thus the infant mortality rate among males from mothers born in Denmark, Norway and Sweden was 74 as opposed to 62 for the females from similar origin. For males born of Polish mothers the rate was 171 as opposed to 124 for the female infants. For males born of negro mothers the rate was 202 as opposed to 166 for the female infants.—*Science*, November 15, 1918. (*M. P. H.*)

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National Tuberculosis Association to Hold Two Institutes in 1919.—Because of the unusual demands that were made in 1918 to obtain membership in the Institute for Tuberculosis Workers, the National Tuberculosis Association, acting with the New York School of Philanthropy, has decided to hold two Institutes in 1919. The first will operate from January 27 to February 12, and the second from May 26 to June 11. The registration fee is $10. The work will consist essentially of discussions touching on every phase of tuberculosis work, together with visits to different institutions of interest. The institute offers an excellent opportunity for training new tuberculosis workers, and for aiding those who desire additional training. Applicants should address Philip P. Jacobs, 381 Fourth Avenue, New York City.—*Bulletin, National Tuberculosis Association,* November, 1918. (*M. P. H.*)

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New York City Garbage Disposal.—The Cobwell process of garbage disposal as adopted at Staten Island for the disposal of New York City garbage is far more economical than the old Arnold process in use for more than twenty years at Barren Island. The Cobwell process yields 10 per cent more grease and 60 per cent more fertilizer, while the aggregate value of all products exceeds that of the Arnold process by 20 per cent. The new system is also more economical in time, the garbage passing through the plant and appearing as grease, tankage, rags, bones, etc., in about twelve hours instead of three days as at Barren Island. The Staten Island plant consists of two hundred reducers of a capacity of five tons each and provision for fifty additional reducers. The garbage is taken directly from the scows and emptied into the reducers where it is treated with naphtha. The moisture in the garbage and the solvent are vaporized and passed to a condenser. Fresh naphtha flows to the reducer to replace that passing off as vapor. After about five to seven hours of such treatment, the garbage remains as residue, submerged in a body of naphtha. The naphtha is driven off by the live steam while what remains passes to a conveyor which delivers it to rotary screens.

Material not passing the screens continues on to a belt conveyor from which pickers remove the rags and bones. These are dumped into separate bins and the rags are washed, sterilized and baled. The remaining material is then ground and returned to the screens. The solvent bearing the grease has in the meantime been drawn off the reducers to a still and the naphtha driven off and condensed to be reused, while the grease passes to storage tanks. The by-products of the process, grease, tankage (as the dried garbage is known), bones and rags find a ready market. The grease is used in the manufacture of soap and glycerin while the tankage is converted into an excellent fertilizer.—*Monthly Bulletin of the Department of Health of the City of New York.* (*M. T.*)

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Constructive Health Work in Jerusalem—With the occupation of Palestine by the British forces have come numerous sanitary improvements, introduced essentially by the Royal Sanitary Engineers. One of the most important improvements has been to bring an absolutely pure spring water supply to Jerusalem. The source of the supply is capable of yielding 14,000 gallons per hour. This water which was previously running to waste was lifted to the top of a hill and then run by gravity through a long pipe line to standpipes all over the city, and also direct to hospitals. The people may either carry the water from these standpipes, or on clearing cisterns at their residences, a pipe line will be run from the nearest standpipe to the cistern, thus bringing the water by gravity to the home. Heretofore the people used to depend for their water supply on the winter rains which were caught and stored in the cisterns. The water consumption rate has already increased ten times what it was last year. Cholera, which used to be very prevalent, is absent now.

The people are also submitting to vaccination in large numbers. Typhus and relapsing fever, both lice borne diseases, are disappearing, due to the use of the disinfecting plants all over the country. Infant welfare stations have been opened, and pre-natal and post-natal work begun. The nurses for this work are natives who are being trained for the work. A kitchen is also to be opened to supply food for infants and for the poor.—*The Public Health Nurse,* November, 1918. (*M. P. H.*)

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Biology of Pediculus humanus.—In an exhaustive study of the biology of the louse, Prof. G. H. F. Nuttall (Parasitology X No. 1) brings out for the first time data concerning the life habits of this common pest of mankind. It appears that one female louse will lay as many as 300 eggs and can have 1,918 descendants in her lifetime and 112,778 in that of her daughters, that is within 48 days.

In the first place it may be noted that while the distinguishing characteristic of the head louse is to lay its eggs on hair, the body louse is quite ready to adopt the same habit, and, indeed prefers doing so. The egg has been noted to hatch in 7 days. After hatching, the larva undergoes three moults at intervals of 2 to 3 days, reaching maturity in 7 to 9 days, and 24 to 36 hours later the female commences oviposition; the egg-to-egg stage is 16 to 17 days. The adult lives about 30 days. In this connection it may be mentioned that adult Pediculus capitis is found to be capable of surviving in the dark unfed for 5 days, longest at a fairly low temperature.

As regards prevention, ordinary methods of cleanliness and care of the head—daily combing, brushing and periodic washing—are effective. In school, girls' hair should be kept short or braided; they should have lockers or bags for their hats and not hang them on pegs, while boys should be made to put their caps in their desks or pockets. The use of hair oil and pomade is to a certain extent a protection, and to this the comparative immunity of certain classes of negroes is in a measure attributed.

Useful remedies for lice in the head are: (a) Acetic acid, for removal of nits; (b) Alcohol, with or without camphor; (c) Carbolic acid solution, pomade and oil; (d) Sublimate vinegar; (e) Calomel pomade; (f) Oleate of mercury and vinegar; (g) Oil of turpentine; (h) Balsam of Peru with or without sulphur; (i) Veratrine ointment; (j) Staveacre oil or ointment. —J. M. Martin, *Medical Officer*, October 19, 1918, p. 137. (*D. G.*)

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What the War has taught us about Tetanus.—In short, it may be said that the war has brought us the following ideas: 1. Antitetanic preventive serotherapy is efficacious in the immense majority of cases. 2. When it acts incompletely it so modifies the course of tetanus that it has created new forms of the disease, unknown before its use was general. 3. The study of the checks to serotherapy ought to lead us (a) to use the serum in a more rational way; and (b) to know how to complete its action by that of an antitetanic vaccination.

As to the second point noted above the preventive injection of serum can be seen to modify completely the clinical course of tetanus. One of the most striking features is the inconstancy and variability of the symptoms of postseric tetanus. In ordinary tetanus, that occurring in subjects who havê never received antitetanic serum, the toxin affects successively, in a constant order, all the parts of the nervous system, from the nerves of the region wounded to the bulbo-medullary centers. But in the injected subjects the pathogeny is quite special; the tetanus is the result of an incomplete seric protection. In these conditions the reaction of the higher centers can, from this fact, be incomplete, irregular, and incoördinate. Instead of yielding to the toxin with the habitual regularity of the classical tetanus, each of the centers has become free to react separately, in a variable and even inconstant manner. That is the seric injection protects in general the higher centers, which in the ordinary tetanus are the last affected.

As to the third point nearly everybody admitted before the war that the antitetanic serum had no curative virtue. But this idea is no longer true, for the injection of antitetanic serum is given in large doses in cases of post-seric tetanus. Thus on the appearance of the first symptoms of tetanus there should be injected in two or three days 100–200 cc. of serum and even more.

With regard to the method of injection it seems that one alone may be practically sufficient and free from all criticism—that is the subcutaneous method.

For the prevention of early post-seric tetanus early and complete surgical intervention is desirable, and secondly it is not necessary to hesitate in cases of serious wounds—above all, in the wounds of the lower limb, and quite specially in the cold-bites of the feet which have led during this war to such a large number of cases of tetanus—to make at once an injection of 20 or even 30 cc. of antitetanic serum.

Inspired by the work of Roux and Vaillard, the authors have employed as vaccine an iodized toxin, the same as is used at the Institut Pasteur to prepare the horses providing serum. The power of the toxin which they employed is such that 1/10,000 ccm. sufficed to kill a guinea-pig of 400 g. On mixing this toxin with an iodized solution (iodine 1 g., iodide of potassium 2 g., distilled water 200 g.), in the proportion of two-thirds of toxin to one-third of iodized solution, there is obtained a liquid neutral for the organism, but yet capable of vaccinating it. At first—acting, as can well be supposed, with the greatest prudence—the wounded men were injected the first time with 1 cc. of this iodized toxin, a second time with 2 cc., and a third time with 5 cc. of toxin mixed with 2 cc. of iodized solution. It is recommended that this be carried out only five days at the soonest after the last seric injection, so as to avoid part of the toxin being absorbed by the antitoxin of the serum and thus becoming unsuitable to ensure the immunising reaction.—C. Achard, and C. Flaudin, *Lancet*, October 19, 1918. (*D. G.*)

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Guarding Against Pneumonia by Vaccination.—Health officers will be interested in the following memorandum just issued to officers, enlisted men, and employees in the War Department:

"1. Vaccination against pneumonia has been given in two army camps. At Camp Upton during the ten weeks from the period of vaccination until the troops went overseas, no cases of pneumonia due to the types of pneumococcus protected against (I, II, and III) occurred among the vaccinated troops. The incidence of pneumonia from other organisms was only one-tenth as high among the vaccinated as among the unvaccinated although previous to vaccination the incidence of pneumonia had been equal in the two groups.

"2. The vaccine now being used is a lipo vaccine given in a single injection, and containing pneumococci types I, II, and III. Reactions are, as a rule, rather less pronounced than after antityphoid vaccination.

"3. This vaccine is intended to afford a certain degree of protection to healthy individuals against pneumonia; it is not intended to cure those already sick. It is not advised for persons suffering from acute colds or fever.

"4. This prophylactic vaccination is available to all officers, enlisted men, and employees on duty in the War Department who desire it. It will be administered at the Army Medical School, 462 Louisiana Avenue, N.W., between 4 and 4.30 p. m. every afternoon except Sunday."

F. F. Russell,
Colonel, Medical Corps, U. S. A.
—*Public Health Reports*, November 1, 1918.
(*D. G.*)

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The Need for Visiting Nursing in Industry.—As part of the great campaign for disease prevention, industrial nursing should be included. Already 460 firms, located in 205 cities and towns, and in 36 states are employing 567 nurses. This number should be greatly increased, as one of the effective means of combatting disability, infection, long and frequent absences, deaths, accidents, and other causes for diminished efficiency which occur in industry. The care of the worker is particularly important now that certain new industries, with serious inherent dangers have been introduced in this country as a result of the war. An industrial nurse will detect early and slight injuries which would ordinarily be unobserved by the worker himself. She would be sought more frequently for first aid advice by the worker, than if a physician is employed. The visiting nurse usually becomes a friend of the family, and so is able to materially assist in combatting infant mortality, in teaching the family how to live in a clean way, how to get the most value of the food that is bought, and how to live in order to have health and vigor. A nurse will also look after the sanitary conditions in the factory, and will be able to detect conditions that may lead to accidents before they occur.—*Safety Engineering*, October, 1918. (*M. P. H.*)

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The Mortality of Childhood.—The mortality of childhood may conveniently be grouped under six heads. In the first group are causes indicative of prematurity, of congenital debility or of injury at birth. Close to a quarter of all deaths under age fifteen are found registered under these titles.

The second group—diseases and conditions of the digestive tract—is of importance throughout the entire range of childhood, but the highest mortality is found in the first year of life. In the second year the rate is reduced to about one quarter of what it was in the first year, although it is the first of all causes in its relative importance at this age. For each age thereafter, there is a progressive decline up to including the age period 10 to 14 years, when the minimum death-rate for childhood is reached.

The third group—diseases and conditions of the respiratory system—accounts for 16.4 per cent of all the deaths in the ages of childhood. Bronchopneumonia is the most important of these causes of death. The highest death-rate for these diseases is recorded in infancy and the mortality declines with each succeeding age period until the minimum is found in the years 10 to 14.

The fourth group—measles, scarlet fever, whooping-cough and diphtheria—accounts for 10.7 per cent of all deaths in the first fifteen years of life. Diphtheria is the most important of the four followed by whooping-cough, measles and scarlet fever in the order named. The highest mortality from whooping-cough is found in infancy. Measles and diphtheria show their highest mortality rates in the second year and scarlet fever in the third year of life. These diseases then decline to a minimum point in the age period 10 to 14 years.

In the fifth group—accidents and injuries—burns account for an appreciable percentage of the total mortality from the second to the fifth year of life. Falls play an important part between the second and fourth year, while vehicular accidents have their maximum incidence at the age period 5 to 9 years.

In the last group—miscellaneous and infectious diseases—organic diseases of the heart first begin to assume prominence in the fourth year and increase in frequency up to the age period 10 to 14 where the maximum rate for childhood is recorded. Diseases of the kidneys are of significance first in the fourth year. Tuberculosis, an important cause of death throughout all the ages of childhood, is highest in the first year of life, decreases to a minimum in the period 5 to 9 years, and rises thereafter.

Tuberculous meningitis is the chief form of tuberculosis in the first ten years of life.—Dublin, L. I., *Quarterly Publications of the American Statistical Association,* 1918, XVI, p. 921. (*D. G.*)

⁂

Miles Acid Treatment of Sewage Recommended. Professor C.-E. A. Winslow, and F. W. Mohlman conclude, after some extensive experiments on the treatment of the sewage from New Haven that it would be best to treat a portion of the city's sewage by the Miles Acid Process, while the other portion might best be treated in Imhoff tanks. The following reasons for recommending the acid process are given:

1. The necessity of locating the sewage works in a thickly settled district, where treatment on filter beds would be impossible, sludge disposal difficult, and the production of offensive odors fatal to the plant.
2. The character of the soil at the outfall which would make the construction of deep tanks costly.
3. The presence of antiseptic industrial wastes in the sewage which would make the results of a biological method of treatment uncertain.
4. The necessity for removing a considerable portion of the finer suspended solids in order to avoid deposits in the harbor channels.
5. The probable necessity for bacterial purification in order to protect shellfish and bathing beaches.

The investigators do not hold out any hope that the Miles Acid Process will net a financial profit, unless the sewage is exceptionally high in grease content, and low in alkalinity.—*Municipal Journal,* October 12, 19, 26, 1918. (*M. P. H.*)

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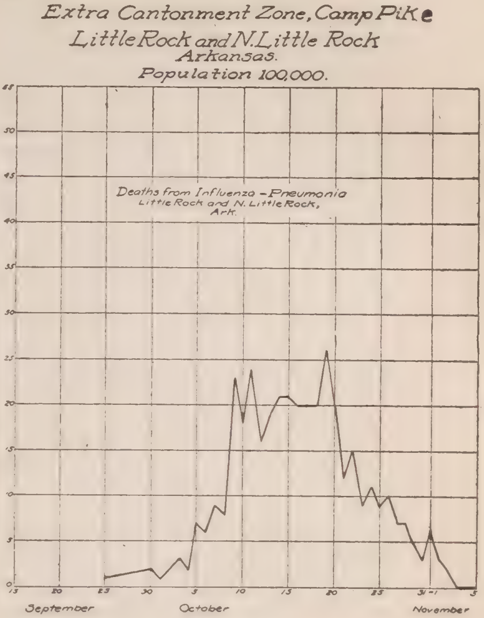
STATE HEALTH NOTES.

Arkansas.—The regulation adopted last December by the State Board of Health of Arkansas requiring a certificate of successful or recent vaccination as a condition precedent to the attendance upon the schools of the state has been sustained by the Supreme Court of the state. In the opinion of the court the State Department of Health had the power and right to enforce the regulation. Commenting on the case the court stated in part: "It would not be contended that parents or guardians could send their children to school unclad or unfed." Other health regulations are just as important as food and clothing. (*M. T.*)

Little Rock, through R. E. Tarbell, engineer of the U. S. Public Health Service, sends a correction to the influenza-pneumonia graph in the November issue. The figures for population, the best obtainable at the moment in Boston, prove to have been too low. The zone for which the report was made has a population now of 100,000. Mr. Tarbell sends a chart on this basis which will place Little Rock where it belongs.



New Brunswick.—New Brunswick has a new health act, that of 1918, which was proclaimed to be in force early in October. Because of its provisions, which are essentially democratic, it will take some time for the organization it provides for to become complete.

It establishes a department of health as a regular branch of the Provincial Government, and the Hon. Wm. F. Roberts, M. D., of St. John, N. B., has been appointed minister of the department and administrator of the act. For an immediate staff he has a chief medical officer, Dr. George G. Melvin, holding a degree in public health; a chief of laboratories, Dr. H. L. Abramson, late assistant to Dr. Park of New York, a medical man skilled in laboratory work; and three district medical health officers, Dr. Brown, Dr. Wade and Dr. Desmond, one in each of the three health districts into which the province is divided. These health districts are, in turn, divided into sub-health districts, corresponding with and coterminous with the various counties. In each of these sub-districts, or counties, there is, or will be, a sub-district board of health, with very wide powers, in conjunction with the District Medical Health Office, over all matters connected with public health, including the collection of Vital Statistics and the Medical Examination of Schools. These boards are appointed, largely, by the local municipal or county councils, the government reserving to itself the duty of completing each board with the appointment of a minority representative of one or two members.

The board, according to the act, must be adequately staffed in order that the intents of the Act may be carried out. The members of the boards themselves serve without pay, but the working staff, of course, will be on salary, either part or whole time. It is the confident hope of the minister that within a reasonably short period, New Brunswick will have an up-to-date and efficient public health service at a very moderate cost. The minister himself, a physician with a large practice, is an enthusiast in public health matters, and, at great sacrifice of his own private interest, has successfully brought the new act into being, and is prepared to put it upon a sound and permanent working foundation. It will be noted that through the municipal councils, which are the primary representatives of the people in their Canadian Province, the latter are brought into close touch with the control and governmental department on the one hand, and with the local boards of health on the other.

The councils pay the cost of maintaining the local service, while the government bears the expense of the Central Department and its supervising officers. The system is a closely knit one, and while it is democratic, as has been noted, is yet centralized enough to give it coherence, stability and continued efficiency. It departs quite markedly in a good many particulars, from the usual form of state and provincial public health organizations, and its future career will be watched with interest and its success will be warmly welcomed by all who have the welfare of the people at heart.

(*George G. Melvin.*)

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New York State.—During the recent epidemic of influenza, many families suffered from lack of food due to the fact that the mothers or others responsible for preparing the meals were stricken with the disease.

In Syracuse, at the suggestion of Dr. Frederick W. Sears, sanitary supervisor of the district, the diet kitchens of many of the schools which were not then in operation were utilized to prepare meals for such families, the food being distributed by automobiles. The plan was carried out through the coöperation of Doctor Sears, chairman of the Medical Relief of the American Red Cross through whom the scheme was financed, the superintendent of public schools and the director of school diet kitchens. A total of 16,982 meals were served during the first week at a per capita cost, for the food, of only four cents. Later as the patients began to improve and needed more substantial food the per capita cost increased to .069. In many cases the relief from suffering, hunger and anxiety over food conditions was a great factor in the recovery of those sick while others not already ill were fortified against the disease.

The influenza epidemic in New York State has practically subsided. A number of municipalities, especially in the western part of the state, where outbreaks have been more recent, had temporary increases in number of cases reported, following the peace celebration. Thus far 257,758 cases have been reported in the state, outside of New York City.

One hundred and five cases of typhoid fever were reported from the village of Herkimer during October. This outbreak occurred conjointly with the influenza. Notwithstanding a provision of the State Sanitary Code requiring Widal tests in all cases suspected of being typhoid a number of physicians failed to confirm their diagnosis by agglutination tests. There is a possibility therefore that a few of these cases may have been influenza. The outbreak was clearly the result of polluted water. For several days during September polluted water was pumped into the mains from West Canada Creek, and from the Hydraulic Canal while the chlorinating apparatus was not in operation. The municipal water commission of Herkimer had been previously warned of the danger of permitting the use of raw water from this source. Twenty-five additional cases had been reported up to November 23, most of these probably being secondary to previously existing cases.

(*B. R. Rickards.*)

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New York City.—New York which has always insisted on the proper control of dogs by their owners has a further amendment to Article 12 of the Sanitary Code. This orders that "No person having the right and ability to prevent shall knowing, carelessly or negligently, permit any dog to commit any nuisance upon any sidewalk of any public street, avenue, public square or place in the city of New York." Halls of tenement houses, fences, walls or stairways of any building, ferry houses, depots stations, railroad platforms, theatres, stores, factories, the roofs of tenement houses, hotel halls and stairways, and all other places used in common by tenants or the public are proscribed for the dog.

The Metropolis has added to the same article of the Sanitary Code a new section, which orders that to prevent communication of disease all persons shall properly cover the nose and mouth when coughing or sneezing.

As a new feature, through the coöperation of a motion picture organization, scenarios have been prepared on topics of health,—contrary to usual methods in health education, these pictures to play on important health matters, the sneezer, the sprayer, the cougher, the spitter, the common drinking cup, the common towel, dry sweeping, hair dyes, patent medicines and similar subjects. These are written by a professional humorist and are being pictured for distribution through the "Weekly News" and when exhibited throughout the country should bring good results by calling public attention to these matters which might otherwise be overlooked.

In New York City, through the coöperation of the Board of Education, Health Department and physicians, a course of lectures is proposed in a kind of "first aid" in the detection of communicable diseases. In a registration of about 900,000 pupils there is an average of 6,000 cases of major contagion (scarlet fever, diphtheria, measles, whooping-cough, tuberculosis, gonorrhea and syphilis) and about 300,000 cases annually of the minor contagious (eye diseases, ring worm, lice, itch, impetigo, favus, and molluscum contagiosum). Early and prompt recognition of these would no doubt reduce very materially the infections.

The program has not yet been settled but it is hoped to have the lectures given weekly and within school hours so that attendance on the part of the teachers will be obligatory.

(*S. Dana Hubbard.*)

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North Carolina.—The State Board of Health is now furnishing diphtheria antitoxin for twenty-five cents a package, irrespective of size. With the inauguration of this practically free distribution of antitoxin, the Board has adopted the policy of fixing the blame for future deaths from diphtheria. The records from four thousand cases of diphtheria, carefully recorded by the Chicago Health Department, show that less than 6 per cent of the children given the antitoxin as late as the third day die from diphtheria, while less than 2 per cent die if given the treatment on the second day. Consequently, it is evident, now that diphtheria antitoxin is available to everyone, there must be someone to blame for every diphtheria death except only the negligible few that die in spite of the use of the antitoxin. The State Department of Health undertakes to investigate one hundred deaths from diphtheria by a personal visit of the epidemiologist and fix the blame either on the parents, the attending physician or the health officer or else classify it as unavoidable. The results of this work will be printed in the North Carolina Health Bulletin from time to time.

Parents will be considered responsible when they fail to call a physician on a reasonable suspicion of diphtheria or when they prevent the administering of the antitoxin. A reasonable suspicion may be said to exist (1) when a child has a sore throat and fever and a whitish, yellowish, grayish membrane on the top or back of the throat; (2) when a child living or visiting a community in which the disease exists develops a sore throat; (3) when a child living in a family in which the disease has occurred more than once in the past few months develops a sore throat and perceptible fever.

The doctor is guilty when he is called on the first, second or third day and fails to give the antitoxin, whether he diagnoses the case as diphtheria or not. He is, also, when a child who has been exposed in a family which he has been treating is not immunized after the exposure has been called to his attention. The attending physician is duty bound to immunize every member of the family in which diphtheria occurs, unless he applies the Shick test and finds the person exposed possesses a natural immunity, or unless the person exposed shows a decided predisposition to serum shock, or unless the physician is in position to exercise careful supervision over the family to detect secondary cases at their onset.

The health officer is guilty when a child dies because antitoxin is not available in the county at a price within easy financial reach of any family, and he is also to blame when he fails to notify the family, as required by the state law, of the occurrence of diphtheria in the community, giving them at the same time an official statement as to the danger of the disease and the way of avoiding that danger.

(*M. T.*)

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North Dakota.—Isador W. Mendelsohn, formerly at Worcester, Mass, has been appointed chemist and sanitary engineer with the State Public Health Laboratory, the main laboratory being at the University of North Dakota, Grand Forks, N. D.

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Pennsylvania.—The State Department of Health has issued an interesting "Primer" on influenza in which the subject is discussed under the following heads: isolation, notification, food and pure air, light and sunshine, utensils sterilized, early medical treatment, nursing, zymocides and antiseptics, after-care, personal hygiene, rest and sleep, institutional care, masks and other protection, eating and drinking wisely, and refraining from alcohol.

This pamphlet is evidently intended primarily for the layman, but supplementing it is a valuable four page "Special Bulletin on Influenza Prepared for the Medical Profession." This last bulletin treats the subject under the heads of causation, epidemiology, prophylaxis, diagnosis and treatment. The pamphlet is sufficiently brief for the overworked doctor to read in a few minutes, yet sufficiently complete to be well worth the time spent. (*M. T.*)

Texas.—Charles Saville, formerly director of public health of the city of Dallas, has been elected director of the Department of Industrial Development of the Dallas Chamber of Commerce and Manufacturer's Association, a position recently created to meet the industrial problems resulting from or intensified by the war. The activities of the new department include a junior membership plan, housing and health protection for industrial workers, a bureau of industrial relationships, and a comprehensive program for community development, all of which are based on the fundamental principle that business and commercial life, like community life, are more dependent on the character of citizenship than upon the population or the number of factories.

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Vermont.—Dr. W. T. Slayton of Morrisville has been appointed a member of the Vermont State Board of Health to succeed Dr. Charles S. Caverly, deceased. The Board has been reörganized with the following officers; Dr. F. Thomas Kidder, Woodstock, president and treasurer, Dr. Charles F. Dalton Burlington, secretary and executive officer.

Dr. H. L. Pache of Danville, Vt., has been appointed inspector of the Vermont State Board of Health to succeed Dr. H. A. Ladd now superintendent of the Mary Fletcher Hospital in Burlington.

Reports now received by the State Board of Health indicate a total of 33,555 cases of influenza in the state during the recent epidemic. This is nearly 10 per cent of the population of the state. Total deaths, including those due to pneumonia, were 1,089.

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West Virginia.—The State Department of Health, recognizing that education must in the last analysis be the true foundation on which to base any movement for better public health conditions, has obtained a standard railroad passenger coach and fitted this out as a traveling health exhibit.

The models shown have been designed to bring out the salient features of a large number of public health problems, and they afford the people an easily remembered illustration of some of the ways in which disease is spread.

As several of the models are mechanical, it has been necessary to provide a complete electric power plant, and this is of sufficient capacity to operate a standard motion picture machine. A small laboratory has been provided in one end of the car so that complete bacteriological and chemical examinations may be made. The car put into operation under the care of a lecturer about the middle of November will, it is expected, take at least two years to cover the entire state of West Virginia.

Mrs. Lucy Frances Gabel, wife of Dr. Charles Gabel, director of the West Virginia State Hygienic Laboratory, has been appointed chemist in the State Laboratory.

Dr. R. W. E. Cole, epidemiologist to the State Board of Health, has resigned to take a position with the New York State Department. (*M. T.*)

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Wisconsin.—Influenza during November was distinctly on the wane in all parts of the state of Wisconsin. State Health Officer C. A. Harper estimated the death toll for the state due to the epidemic to be about 3,000 up to November 1.

Health Commissioner G. C. Ruhland, M. D., of Milwaukee, has asked for a special joint committee of the state legislature to frame a bill to stop the pollution Lake Michigan supplies of drinking water. The bill will compel cities on Lakes Michigan to build sewage disposal plants. Among the larger lake cities immediately affected are Milwaukee, Racine, Kenosha, Port Washington and Sheboygan.

The sum of $30,000 was recommended by a committee of the Milwaukee county board recently to be applied to establishing a general clinic and public dispensary for the county. City and county physicians united in support of the plan.

Milwaukee county is considering the erection of a million-dollar county hospital of 500 beds.

Dr. L. W. Sayles, health officer of Baraboo, has been appointed captain in the medical corps and assigned to Camp Funston.

Mrs. John Bache-wiig, recently of the nursing staff of the Willard-Parker hospital in New York city, has become nurse for the city health department at Wausau, Wis.

Dr. Harry Burger, former health officer of Beloit, has been commissioned lieutenant in the medical reserve corps. Dr. Simon Berglund, health officer at Marinette, has joined the medical service at Fort Riley, Kansas.

Dr. C. A. Harper, state health officer, has been made Wisconsin representative of the United States Public Health Service.

Dr. G. L. Bellis, formerly superintendent of Muirdale sanatorium, Milwaukee county, now stationed in France where he is in hospital service, has been promoted to major.

Bayfield county officials have voted to employ a county nurse.

Miss Mary Larson has resigned as visiting nurse of Wausau, and gone to Camp Sherman, Ohio, to prepare for army nurse duties overseas.

During the influenza epidemic Dr. V. A. Gudex, Milwaukee, was appointed for special service in fighting the disease and assigned to Glidden, Wis.

(*L. W. Bridgman.*)

INDUSTRIAL HYGIENE AND OCCUPATIONAL DISEASE

Abstracted by Drs. E. R. Hayhurst, R. P. Albaugh, and P. M. Holmes.

Resolutions on Industrial Hygiene.—Among resolutions unanimously adopted by the Ohio State Federation of Labor at its annual session, held in Columbus, in October, were those covering the subjects of Venereal Diseases, The Health Supervision of Schools, The Care of Expectant Mothers, The Reorganization of the Local Health Agencies of the State, and one on the subject of Industrial Hygiene. The resolution upon the last point is as follows:

Resolved, We favor continuous investigation, research and study of problems of industrial sanitation, and for measures to eliminate so far as possible occupational diseases.

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Heart Diseases Among Wage-Earners.—There were 75,345 deaths from organic heart disease among the policy-holders of the Metropolitan Life Insurance Company, from 1911 to 1916 inclusive. This was the chief cause of death and made up 11.9 per cent of the total of 634,499 deaths. In the general population, this cause of death is higher among colored persons and among females than males, up to the age period 20 to 24 years. With wage-earners the death-rates in the later age periods are higher than in the general population, and much higher for males than females between the ages of 25 to 45. —Louis I. Dublin, *Boston Med. and Surg. Jour.*, Sept. 26, 1918.

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Lead, Turpentine, and Benzine Poisoning in Four Hundred Painters.—Harris and his staff at the Occupational Clinic of the Board of Health in New York City, first overcame the misgivings of members of the Brotherhood of Painters by distributing 20,000 educational circulars among them. Those painters who came to the Clinic for examination were all employed as interior painters and decorators. He divides his cases into four general groups: (1) active or positive; (2) latent, inactive, or laboratory positive cases; (3) doubtful or border line cases; and (4) negative or normal cases. In the first two groups lead was found in the urine. The lead pigments most used by the painters are, in the descending order of their commercial importance white lead, sublimed white lead, red lead, and chrome yellow or green lead. Harris found that poisoning was due to the usual procedures, such as sanding, while turpentine and benzine exhibited the usual proportion of complaints. Twenty-one per cent of 304 cases were total abstainers from alcoholic drinks, while about 55 per cent drank very little. The usual symptoms of lead poisoning are discussed. Only three cases of wrist-drop, twenty-two cases of lead line in the gums and thirteen cases of stippling of red cells were found. Seventy-five cases gave a definite reaction for lead in the urine. The technique of the test for this is described. Of 162 painters who had active symptoms of plumbism, only ten gave a positive Wassermann reaction, and in each case the history was suspicious. The birth-rate and number of miscarriages are stated, although no comparison is made with other groups in other walks of life. An investigation of home conditions of 115 painters showed the sanitary conditions good. The idea of the substitution of zinc for lead in paint is discussed in brief, and the usual points in prevention are given. In connection with the work, Dr. Alice Hamilton made an investigation of the conditions under which painting on public buildings was done in New York City. It was found all the conditions which usually obtain in the painters' trade were also present here.—(This study should be compared with that discussion in Bulletin 120, U. S. Dept. of Labor, "Hygiene of the Painters Trade," 1913. The abstractor would state that as in the 100 painters examined in Chicago, the examinations were made during the dull season of the painters' trade, and that a distinction should probably be made between active cases as classified by Dr. Harris, and acute cases such as occur at the height of the painters' season, and are seen in hospitals and dispensaries.

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Health Insurance From Its Medical and Hospital Aspects.—Dr. Lapp states that not 1 per cent of the people of Ohio are possessed of enough property to insure against dependency, if they should be stricken with a prolonged disabling sickness. After stating the purposes for which the Ohio Commission was appointed, he maintains that Health Insurance should provide two main benefits: (1) Cash Benefits to be paid during disability; and (2) Medical Benefits, including care by physicians, nurses, hospitals, and dispensaries, and the cost of medicines. Medical benefits are considered the most essential, and illustrative hypothetical cases are given. No one doubts the value of health insurance, at least none who approve of fire, life and accident insurance. The only question at issue is whether health insurance can be and should be organized by the state on a universal compulsory basis. This is the question which the Ohio Commission considers its duty to solve. To all persons who are impressed by the evidences of ill health and disability, it must appear that correction and prevention are of the first importance. Prevention can best be accomplished in an insurance plan by putting a money premium upon it. The community, the industry, or the worker who fails to promote health, should be charged extra for the neglect. On the positive side, a premium should be placed upon improved conditions. Private insurance companies are not concerned as a business proposition with the prevention of disease. The state, on the other hand, should prevent all preventable diseases as a social policy, and health insurance organized by the state provides a most complete plan. No system of working-men's compensation can be permanently successful without adequate rehabilitation work, and a health insurance plan should also provide for rehabilitating men who are handicapped by illness or physical defects. In this work the hospitals must play the largest and most important part. They might be organized on the plan of the military hospitals in the war, with dispensaries and clinics locally, emergency hospitals at county seats, and base hospitals at the larger centers.—John A. Lapp, *The Modern Hospital*, Sept., 1918, pp. 160–165.

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Employment of Pregnant Women.—Dr. Deacon had under observation during the nine months from the beginning of June, 1917, to the end of February of this year, 575 married women, and 622 single women employed in a munition factory. She came to the conclusion that it was better to keep pregnant women at work until within a few weeks before confinement than to dismiss them at once. A good feeling was promoted between the employers and employed when it was found that the management was not ready to penalize for a natural physical disability, where all the trouble falls upon the woman, while the benefits accrue to the state. Such good feeling produces actually better work among all the other women employees. The pregnant worker saves more money for the time during which she would be laid by, and can thus afford to take a longer rest thereafter, which implys full opportunities for the breast-feeding of the infant. It was found that miscarriages were actually fewer where the condition was known at an early date, and the worker not tempted to promote them. Furthermore, her records showed that women who had worked had not suffered by so doing, and had produced healthy children. One point is to place the pregnant woman into lighter forms of work. The education of factory managers is what is chiefly required. They are not necessarily callous, but simply without sufficient knowledge of physiology and sociology to enable them to understand.—Mary A. S. Deacon, *The Lancet*, London, Sept. 7, 1918.

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Diabetes Among Wage-Earners.—In the general population the death-rate from diabetes increases with age. There is a lower death-rate among colored persons at each of the age periods, and this is especially true of colored females as compared with white females. Under forty-five years diabetes is most prevalent among males; after forty-five the condition is reversed. Among wage-earners, the diabetic death-rate is lower than the corresponding population rate, in the case of males under 20 years and females under 35 years of age. Beyond 20 years of age, however, there is an excess in the rate of insured white males, which increases up to the period 35 to 44. With females, there is also an increase during this period but not so marked. As mistakes with regard to deaths from diabetes mellitus are little apt to occur, real significance may be attached to the statistics which show that there has been a gradual increase of this disease in the Registration Area, since 1900, the rate for white females increasing from 16.5 per 100,000 in 1911 to 20.2 in 1916.—Louis I. Dublin, *Medical Record*, Oct. 12, 1918, pp. 631–632.

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Health and Sanitation Standards, U. S. Shipping Board.—This 31-page pamphlet with insert-diagrams includes general standards, with many comments introduced in the text to cover (1) the health of workers with regard to physical examinations, certain diseases, infections and wounds, medical staff, treatment facilities, the latter including first aid, dispensary and yard hospital; (2) sanitation in regard to water supply, toilets, sewage disposal, refuse disposal, mosquitoes and flies; (3) restaurants and lunch rooms as to general design, health of food handlers, kitchen, foods, and lunch-rooms; and (4) housing facilities covering design, sanitary equipment, recreation, laundry, janitor and plan approval methods. The last three pages concern the technique of the treatment of infections and wounds with dichloramine-T. The Department of Health and Sanitation of the board desires the closest possible coöperation, between the shipyard managers and the Department, so that the problems may be met and worked out in a mutual spirit of purpose to speedily build ships.—(It is to be hoped that the Board will next set standards covering industrial hygiene, especially for such features as the prevention of poisoning, the control of dust, proper illumination at shops, ventilation, etc.—U. S. Shipping Board, Emergency Fleet Corporation, 1918.

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War Time Employment of Women in Metal Trades.—This 79-page report has been prepared chiefly for the information of manufacturers who contemplate the introduction of women workers into their establishments. The report confines itself to a study of results of the employment of women in new occupations; it does not discuss the broad social aspects of the subject. The investigation was carried on by means of schedules of inquiry sent during April and May, 1918, to about 600 selected establishments of which only 131 which replied employed female labor. The chief branches of the metal trade were included in the inquiry, and the replies tabulated. The report should be read in full but in general, the practicability of employing women is demonstrated, particularly on light, repetitive work, where extreme temperatures, poisonous fumes or other serious health or accident hazards are involved. Equal wages for equal work has found fairly general acceptance. Women are somewhat less regular in attendance than men, but labor turnover and the proportion of accidents are less. Substitution of women for men in metal trades has not yet been extensive.—Natl. Industrial Conference Board, *Research Report No. 8*, July, 1918, 15 Beacon St., Boston, Mass.

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Minimum Requirements for Industrial Morbidity Statistics.—This is a synopsis of the report which will be presented before the Annual Meeting of the American Public Health Association, by a specially appointed committee, composed of Louis I. Dublin, chairman, Dr. B. S. Warren, secretary, Carl B. Auel, William A. Hathaway and Dr. Geo. E. Tucker. Five specimen blank forms show the records which it is desired should be obtained in regard to (1) sickness; (2) personnel exposed to sickness; (3) tabulation of sickness statistics. The report ends with a recommendation that the U. S. Public Health Service be made the central agency for the collection, analysis and publication of industrial morbidity statistics. It may be necessary for the Service to put at the disposal of employers qualified clerks who will keep the records of personnel and sickness up-to-date.—*U. S. Public Health Reports*, Aug. 30, 1918, pp. 1429–1435.

Effects of Air Hammers on Stone Cutters.—This 147-page bulletin goes to the bottom of the subject of the effect of the air hammer on the hands of stone cutters, and includes statements by employes, employers, of physicians employed by employers and employes independently, and of official investigations by physicians acting in the capacity of experts, for the Bureau of Labor Statistics, among the latter being Dr. Alice Hamilton of the Bureau, Dr. Thor Rothstein, Rush Medical College, Chicago, Maj. N. A. Cary, Medical Corps, Camp Shelby, Miss., Dr. J. P. Leake, U. S. Public Health Service and Dr. David L. Edsall, Harvard University. (The chief findings of the investigation in regard to the nature of the afflictions produced were stated in these columns for the issue of July, 1918, p. 552.) —*U. S. Bur. of Lab. Statistics, Bulletin Whole No. 236*, July, 1918.

⁂

Sanitation of Rural Workmen's Areas.—Thirty pages are given in this week's issue of the Public Health Reports to the subject indicated in the title, with special reference to housing. The report would be useful as a text-book for beginners in welfare supervision, and as a guide to executives who have not specialized in rural sanitation. The report was prepared by the Divisional Committee on Village and Public Sanitation of the Council of National Defense, of which committee Dr. Geo. M. Kober was chairman and Dr. John W. Kerr, Lawrence Veiller, Geo. H. Verrill and Dr. Wm. C. Woodward the other members. The report is replete with illustrations and diagrams, and the material is discussed under the following main headings: sanitation of enlarging areas; streets; water supply; collection and disposal of excreta; garbage and other refuse; housing in labor camp; permanent houses; and housecleaning and general cleanliness, concluding with an item on local legislation.—*U. S. Public Health Reports*, Sept. 6, 1918.

⁂

Industrial Employment and Infant Mortality.—Insofar as the mothers' employment reduces the acuteness of poverty, it may tend to improve the infant mortality.—Dr. Jessie Duncan in abstract by *Jour. A. M. A.*, Sept. 21, 1918, p. 996.

⁂

What a Marathon Race Does to the Pulse.—Marathon racing does not exhaust a healthy heart sufficiently to produce alternation of the pulse.—Paul D. White. *Jour. A. M. A.*, Sept. 28, 1918, pp. 1047–1048.

PUBLIC HEALTH LABORATORY NOTES

Abstracted by ARTHUR LEDERER, M. D.

Clinical and Epidemiological Studies on Epidemic Meningitis.—The use of a good polyvalent antimeningococcus serum, together with four types of monovalent serum for agglutination tests, detects more accurately all types of meningococci, in routine work on a large scale, than does either polyvalent or monovalent serum used alone. Most of the meningococcus carriers in a company in which a case of meningitis occurs, harbor an organism of the same type as that causing the case of meningitis. Three consecutive negative cultures taken at three-day intervals does not insure permanent freedom of a carrier from the meningococcus. At least five negative cultures should be required, and the carrier cultured at intervals after release.—W. H. Robey, H. L. Saylor, H. E. Meleney, H. Ray and G. A. Landmann, *Jour. Inf. Dis.*, 23, 317 (1918).

⁂

Carbon Dioxid in the Primary Cultivation of the Gonococcus.—An atmosphere rich in carbon dioxid has been found to facilitate the primary cultivation of the gonococcus in medium containing raw proteid. —Charles W. Chapin, *Jour. Inf. Dis.*, 23, 342 (1918).

⁂

A Comparison of Methods for the Examination of Water at Filtration Plants.—Statistics concerning the methods of water examination in connection with twenty-four purification plants in this country show that in no two instances are these methods exactly alike. In order to be comparable, data of water examinations must be collected under identical conditions. Since no uniformity in methods exists among the laboratories in this country, bacteriologic data of water supplies and water purification processes are not amenable to critical comparisons.—John F. Norton, *Jour. Inf. Dis.*, 23, 344 (1918).

⁂

Wassermann Reaction with Glycerolated Human Serum Two Years Old.—Glycerolated serum two years old gave results almost identical with those given by the fresh serum.—E. H. Ruediger, *Jour. Inf. Dis.*, 23, 351 (1918).

⁂

The Spirochetal Flora of the Normal Female Genitalia.—The spirochetal flora of normal female genitalia is similar to that of the male and consists of Treponema calligyrum, Treponema minutum and Spironema refringens. The types are present in varying proportions, but the calligyrum usually predominates, and the refringens is the least frequent. The female genitalia are much richer in the number of spirichetes than the male.—H. Noguchi and David J. Kaliski, *Jour. Exp. Med.*, 28, 559 (1918).

⁂

Improvement in the Method of Isolating the Bacillus of Cattle Abortion through Guinea-Pigs.—Bacillus abortus Bang can be regularly recovered from guinea-pigs inoculated with material containing the bacillus within three to four weeks. The method is especially useful in recovering the organism from fetal membranes which, as a rule, are obtained after having come in contact with fecal matter, bedding, etc. The spleen is the organ in which the bacteria are regularly present and in largest numbers. Cultures must be made from it to insure success.—Ernest W. Smillie, *Jour. Exp. Med.*, 28, 585 (1918).

⁂

A Rapid Differential Method for the Isolation of Bacillus Influenzæ.—It has often been noted that on blood agar plates seeded with influenzal sputum the colonies of B. influenzæ are most numerous and grow to larger size in the neighborhood of colonies of certain other organisms, notably the staphylococcus. The experiments of the authors showed that the more luxuriant growth of the B. influenzæ occurred only in the neighborhood of streaks of hemolytic staphylococci, streptococci, and micrococci, not in the neighborhood of the non-hemolytic strains. On laked blood agar this phenomenon was not observed. The hemoglobinophilic habit of B. influenzæ has been utilized by the authors for the isolation of B. influenzæ from sputum.—J. H. Brown and M. L. Orcutt, *Jour. Exp. Med.*, 28, 659 (1918).

⁂

Rapid Toxicological Examination of Water.—The examination includes the detection of organic pollution, alkaloids, cyanides, nitroprussiates, and the heavy metals.—M. Dugardin, *Ann. Chem. Anal.*, 23, 141 (1918).

⁂

Preservation of Cholera Stool Specimens for Delayed Bacteriologic Examination.—Glycerin, sodium chloride solution, and ox bile were tested for their value as preservatives of cholera feces for delayed bacteriologic examination. Glycerin was found unfit for that purpose, while sodium chloride solution and bile gave good results. Ox bile was found superior to sodium chloride solution in those instances where the cholera vibrios were present in the feces in small numbers.—C. S. Panganiban and Otto Schoebl, *Philippine Jour. Science*, 8, 275 (1918).

*

Scarlet Fever Carriers.—Recognition by clinical signs and by cultures of carriers is the dominant problem in the control of scarlet fever; the isolation and treatment of carriers bears the same relation to the control of the disease as the diphtheria carrier does to the control of diphtheria.—D. M. Lewis, *Boston Med. Surg. Jour.*, 179, 389 (1918).

*

Detection of Nitrates in Water.—The nitrate is reduced to nitrite by means of amalgamated aluminium, the reduction requiring about one hour for completion. The nitrite is then detected by treating 15 cc. of the water with 2 cc. of 10 per cent aqueous antipyrine solution, four drops of acid mercuric sulfate solution, and one drop of 5 per cent potassium ferricyanide solution; a red coloration develops with as little as 0.1 mg. of nitrite per litre of water.—Escaich, *Jour. Pharm. Chem.*, 17, 395 (1917); *Jour. Soc. Chem. Ind.*, 37, 484 a (1918).

*

A New Diagnostic Method for Diphtheria.—Virulent diphtheria bacilli can be differentiated from avirulent strains by cultivating the organisms anærobically in sugar agar contining 12.5 per cent of normal sodium hydroxide solution. Only the true diphtheria strains will grow.—J. L. Burckhardt and M. L. Enriquez, *Centralbl. Bakt.*, 80, 15 (1917).

*

A Simple Rapid Method of Staining Spirochetes.—Spread five drops of a 1 per cent solution of potassium hydrate over the air-dried slide. Without removing the alkali add one drop of the ordinary aqueous solution of fuchsin and allow to stain for four minutes. Wash with water and dry.—H. Lipp, *Dermat. Wochenschr.*, 65, No. 47 (1917); *Abst. Bact.*, 2, 128 (1918).

*

Direct Blue-Printing from Agar Plates.—Permanent records of bacterial plates can be obtained by placing the plates on ordinary architect's blue-print paper and exposing to direct sunlight.—Jean Broadhurst, *Jour. Bact.*, 3, 187 (1918).

*

Report of Committee on Uniformity in the Wassermann Reaction.—Fifty sera were examined by each member of the committee, the members using their own technic and own reagents. The results agreed in only 74 per cent of tests. Next, fifty sera were examined, each member implying a uniform technic but an individual antigen. These results agreed in 86 per cent of cases. Fifty sera examined with a uniform technic and a uniform antigen gave identical results. The conclusion is that a uniform technic and uniform antigen in the hands of trained men will yield uniform results.—William Litterer and Ch. Watterson, *South. Med. Jour.*, 11, 263 (1918).

*

Bacteriology of Influenza.—At a meeting of the Académie des Sciences, Dr. Roux, director of the Pasteur Institut, reported the results of experimental research on the pathogenesis of grip. This work was done on monkeys at first, then on humans, by Drs. Nicolle and Lebailly of the Institut Pasteur of Tunis. Their observations showed that the infection is carried during the active stage of the disease by the nasal and bronchial mucus of grip patients. The monkey can be inoculated with the virus applied to the nasal mucous membrane or injected under the conjunctiva. The symptoms of grip are manifested in about six days. A man developed the same symptoms in about the same time when inoculated subcutaneously with bronchial mucus diluted ten times with physiologic saline solution. The infecting agent seems to be a very small microorganism which passes through the Chamberland filter and which is distinct from all other microbes hitherto described, and notably from the bacillus of Pfeiffer. The subcutaneous injection of this organism into humans reproduces the disease. Intravenous injection, however, does not convey the disease to man or monkey.—Paris Letter, *Jour. Am. Med. Assoc.*, 71, 1676 (1918).

*

Methods for Demonstrating Tubercle Bacilli in the Urine.—By making use of all the laboratory methods at his disposal the author has not always been able to demonstrate the presence of tubercle bacilli in all cases. The guinea-pig test is not infallible and occasionally the organisms may be demonstrated by centrifugalization and staining when the guinea-pig test is negative.—E. M. Watson, *Am. Jour. Med. Sciences*, Nov., 1918, p. 636.

*

Complement-Fixation in Hodgkin's Disease and Allied Infections.—Complement-fixation test in Hodgkin's disease, using the Bacillus hodgkini, preferably an autogenous culture, in the preparation of antigen, may give a positive, possibly a specific, reaction if the serum be obtained from the individual at the proper phase or stage of the disease. Experimentally, animals inoculated with the B. hodgkini give a specific positive complement-fixation. Normal individuals and those suffering from syphilis and tuberculosis have not given this reaction in the limited number tested.—H. T. Kristjanson, *Am. Jour. Med. Sciences*, Nov., 1918, p. 720.

Laboratory Methods in Tuberculosis.—The Ziehl-Neelsen method is still the most dependable and most widely applicable of staining procedures for tubercle bacilli. The carbolfuchsin solutions should be made from basic fuchsin, which can also be obtained in this country under the name of "aniline red." Three per cent hydrochloric acid in 95 per cent alcohol is sufficiently strong as a decolorizer as it eliminates the danger of overdecolorization.

For concentrating or homogenizing the sputum antiformin is most widely used, but a 4 per cent sodium hydrate solution is also very active and does not interfere with staining. Detection of bacilli in the blood is difficult and not recommended. For the cultivation of tubercle bacilli Griffith's method of shaking the sputum for a short time with an equal amount of 10 per cent antiformin and planting without previous neutralization has been tried with success. Animal inoculation is still the most reliable and ultimate test of proving the presence of bacilli in suspected material. The delay occasioned in the waiting for evidence of infection in the inoculated animal can be shortened if more than one animal is injected and one is sacrificed at the end of three weeks.

The complement-fixation tests yield positive results in the majority of tuberculous individuals but this test does not indicate the extent of the lesion nor does it tell us whether the condition is active or latent, healed or opened.—B. White, *Boston M. and S. J.*, Feb. 7, 1918. (*D. G.*)

⁂

Agglutination Test for Spirochete Jaundice.—Normal and syphilitic serums have not agglutinated the spirochetes. The earliest date in which the agglutination test proved positive was the tenth day, but the agglutinins long persist in the blood, up to twenty-two months to date in one case, during last test agglutinating at 1: 1,000. The immunisins do not appear till the fifteenth day.—Martin and Pettit, *Bull. Soc. Med. des Hopitaux*, 42, 672 (1918); *Jour. Am. Med. Assoc.*, 71, 1519 (1918).

⁂

Some Microtechnical Methods and Devices.—The methods and devices described are: (1) Ocular micrometers used as stage micrometers; (2) the square-ruled micrometer used as a position indicator; (3) the square-ruled micrometer for drawing to scale; (4) capillary glass rods for cover-glass supports; (5) autographic records on micrographic negatives; (6) method of recording magnification on micrographic negatives; (7) concentration of glycerin hastened by the vacuum pump; (8) method of making sealed glycerin mounts; (9) the Osterhout mounting method adopted to *volvocaceæ;* (10) a plankton net for larger organisms; (11) washing devices for small objects; (12) method of estimating the number of cells in spheroidal surfaces.—Walter R. Shaw, *Philipp. Jour. Science*, 13, 241 (1918).

⁂

Bactericidal Action of Whole Blood.—The uncoagulated blood of pigeons contains a bactericidal agent which is absent from the blood of the mouse or rabbit. Fresh defibrinated blood of both immune and susceptible species is an excellent culture medium for the pneumococcus, which shows that the bactericidal factor disappears during the process of coagulation. The blood of a man that has recovered from lobar pneumonia prevents the growth of pneumococci belonging to the type which caused his disease. Many of the non-pathogenic bacteria usually met with as contaminations in bacteriological work, as for instance, the B. subtilis, fail to grow when seeded in uncoagulated blood.—G. D. Heist, S. Solis-Cohen, M. Solis-Cohen, *Jour. Immun.*, 3, 261 (1918).

⁂

The Germicidal Action of Freezing Temperature upon Bacteria.—Intermittent freezing of bacteria exerts a more effective germicidal action than continuous freezing. The reduction is much less in milk and cream than in pure tap water, when freezing temperatures are applied, due, no doubt, to physical protection offered to the bacteria by the colloidal and solid matter in suspension. The degree of cold below freezing is not very important in the destruction of bacteria. There is no critical temperature below freezing when the germicidal effect is greatly accelerated. The death-rate of B. coli is much higher in media which are frozen solid than it is in the same media not solid and at slightly lower temperature.—C. M. Hilliard and M. A. Davis, *Jour. Bact.*, 3, 423 (1918).

⁂

The Use of Oxalated and Citrated Blood for Class Study.—The use of oxalated and citrated blood for routine class study is practical and desirable. No differences in staining reactions or in making red or white blood counts could be detected when using such blood.—F. H. Falls, *Jour. Am. Med. Assoc.*, 71, 1379 (1918).

⁂

Method for Isolation of Pfeiffer's Bacillus from Sputum.—Bronchial secretions were mixed with the taurocholate solution, and the mixture was allowed to stand for at least twenty minutes and longer. After exposure streaks were made on human blood agar plates. The method proved satisfactory, and after twenty hours' incubation at 37° C. minute, colorless, transparent droplet-like colonies were easily detected and differentiated.—E. E. Ecker, *Jour. Am. Med. Assoc.*, 71, 1482 (1918).

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AMERICAN JOURNAL of PUBLIC HEALTH

THE JOURNAL OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

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Major Pearce Bailey

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Assistant Surgeon-General J. W. Trask

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Major Elliot G. Brackett

Morbidity Reports and Records of the Army
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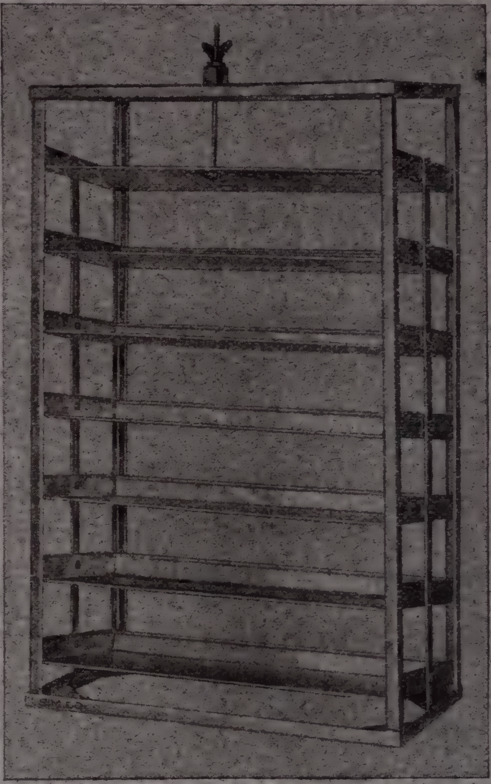

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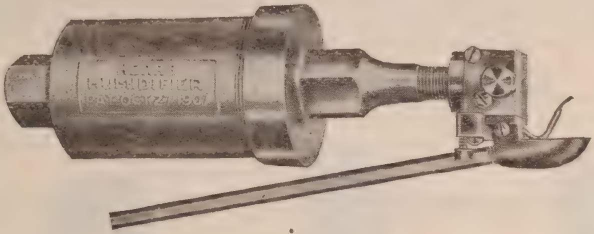

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Since all methods of formaldehyde disinfection rest primarily upon the same principle—that of the liberation of a certain amount of formaldehyde gas in a given space—it follows that the practical problem confronting any municipal health department, simply stated, is, "How can we generate the required amount of gas in the most rapid, efficient, convenient, and economical manner?"

DePree's Formaldehyde Fumigator is designed to solve this problem. Each fumigator is simply a compact little generator charged with a definite quantity of a standardized, non-secret, formaldehyde product, ready for instant operation. It requires no transportation of cumbersome apparatus. It involves no chemical reaction, with its attendant dangers and annoyances.

It is *not* the policy of The DePree Chemical Company to make specific claims of efficiency for its fumigators. We do not assert that a particular size is efficient in a room of given size. Each laboratory is invited to determine its own standard. Fumigators are made in several different sizes; it is obvious that within the limitations of Formaldehyde any required degree of efficiency may be obtained by simply increasing either the size, or the number of units, of fumigators.

This policy has demonstrated to over three-fourths of the Municipal Health Departments of the United States and Canada that DePree's Formaldehyde Fumigator offers more efficiency per cost unit than the old fashioned methods of Formaldehyde disinfection.

The DePree Chemical Company

CHICAGO, ILL.

Laboratories: Holland, Mich.

MULFORD
FOR THE CONSERVATION OF LIFE
LABORATORIES

"An Ounce of Prevention Is Worth a Pound of Cure"

Immunize your patients against Influenza and "Colds" NOW. **Do not wait** until respiratory affections are prevalent.

Influenza Serobacterin Mixed Mulford will give immunity from "Colds" and Influenza to a large percentage of patients infected by the organisms used in preparing the Serobacterin.

Supplied in packages containing four aseptic glass syringes as follows:

	Syr. A	Syr. B	Syr. C	Syr. D
B. influenzæ	125	250	500	1000 mil.
Staphylococcus albus .	125	250	500	1000 mil.
Staphylococcus aureus .	125	250	500	1000 mil.
Streptococcus	125	250	500	1000 mil.
Pneumococcus	125	250	500	1000 mil.
M. catarrhalis (group) .	125	250	500	1000 mil.

Mulford Typho-Serobacterin

For Immunization and Treatment of Typhoid Fever

The value of immunizing against typhoid fever is established. The results secured by the Armies and Navies of all Nations now at war absolutely prove its efficiency. Supplied in packages of three aseptic glass syringes, graduated as follows:

	1st Dose	2nd Dose	3rd Dose
Bacillus typhosus	1000	2000	2000 million
B. paratyphosus "A" . . .	500	1000	1000 million
B. paratyphosus "B" . . .	500	1000	1000 million

Also supplied in 4-syringe therapeutic package and 5 c.c.

Typho-Serobacterin Mixed is coming into general favor for immunization as well as treatment. It affords immunity against the typhoid and the paratyphoid "A" and "B" bacilli present in about 10% of typhoid cases.

Literature describing method of treatment and dosage, together with special educational bulletins for distribution to your patients, sent on request.

H. K. MULFORD CO., Philadelphia, U. S. A.
Manufacturing and Biological Chemists

29445

ANNOUNCEMENT

TO

Physicians, Public Health and Social Workers

of the

United States and Canada

THE Metropolitan Life Insurance Company invites physicians, public health and social workers to make use of its valuable collection of mortality statistics.

These statistics present rates for the principal causes of death among white and colored wage earners in the United States and Canada. The material covers over ten million individuals for each of the six years, 1911 to 1916. Death rates are available for each race and sex, and by age period.

The Company hopes in this way to aid in the study of disease and disability among wage earners. It desires to stimulate medical investigation and research. By offering these statistics to the medical profession and to public health and social workers, the Company expresses also its appreciation of the co-operation which it has received from physicians and others who have replied to inquiries and have given detailed information in thousands of cases. This assistance has helped to make the statistics more accurate and valuable.

The Company is ready to receive inquiries regarding the incidence of diseases or conditions causing death.

All inquiries should be addressed to

Statistical Bureau

Metropolitan Life Insurance Company

One Madison Avenue - New York City

Libby's

Fruits Picked and Put Up Within a Few Hours!

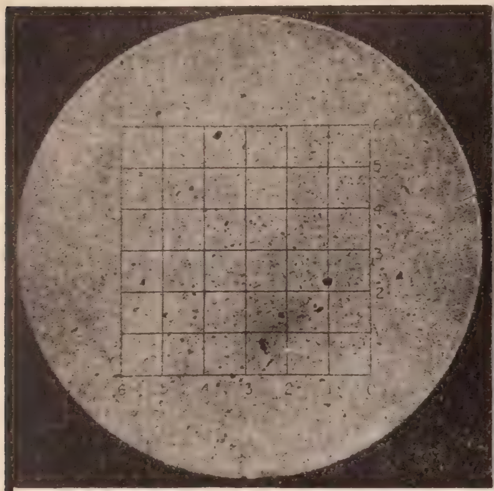
Dust, with powdered sugar, cups made from scooped out halves of oranges. Fill with Libby's Hawaiian Pineapple, Libby's Pears, each diced rather small, and Libby's California Cherries. Cap with mayonnaise dressing and stiffly whipped cream. An excellent way to use any fruits left over from other dishes.

In the center of a bowl bordered with lettuce arrange slices of Libby's Hawaiian Pineapple. Garnish with strips of Libby's Pimientos and serve with a light mayonnaise. The wonderful flavor of Libby's Hawaiian Pineapple makes this salad exceptionally delicious.

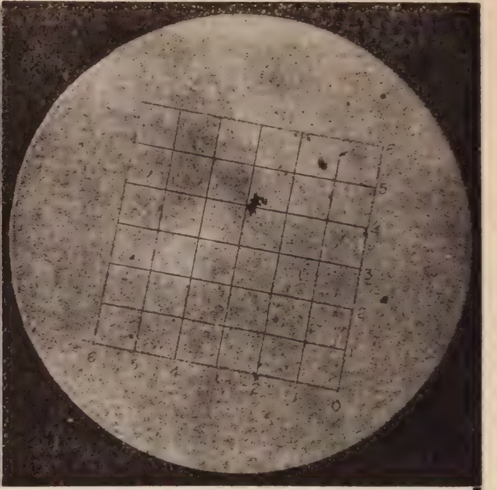
YOU know that putting up fruit the moment it is picked gives you a finer, more wholesome food, with a more delicious flavor. That is why Libby has built special fruit kitchens wherever the most perfect fruits are grown.

There, within a few hours after the sun-ripened fruit is picked, it is sealed tight in its package. All the fresh, wonderful flavor of the pure, luscious fruit comes straight to your table.

Libby, McNeill & Libby
CHICAGO

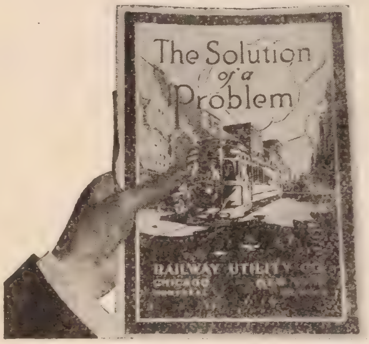


Showing the Dust in a Chicago Street Car. (From an Official Test Made Before the Cars Were Equipped with UTILITY VENTILATORS



Showing Comparative Freedom from Dust in Chicago Car Equipped with UTILITY VENTILATORS. (Official Test)

Chicago's Street Car Ventilating Problem and How It Was Solved



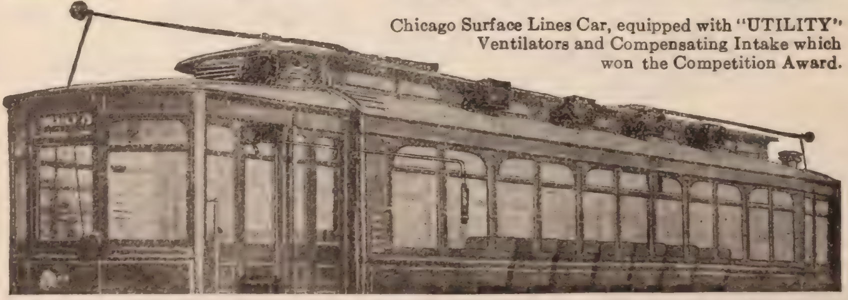
The problem confronting the railway officials was to obtain ventilating equipment which would fulfill the following requirements:

1. The equipment must supply under all operating conditions, the amount of fresh air necessary to the health and comfort of the passengers.
2. The fresh air supply must be reasonably free from dust and other contamination.
3. The distribution of the incoming air must be uniform and not of sufficient velocity to cause objectionable drafts.
4. The first cost of the equipment must be reasonable.
5. The cost of maintenance should be moderate.
6. The equipment must be absolutely weather and storm-proof.
7. The operation of the device must be absolutely automatic.

The manner in which every obstacle was successfully overcome to the entire satisfaction of both city officials and street railway officials, forms a most interesting narrative. It is entitled "The Solution of a Problem" (illustrated).

It will be sent you without charge or obligation. Public Health Officials will find in it, valuable information with test data, charts, formulae, and photographs. *WRITE FOR A COPY.*

Railway Utility Co. Mfrs. of Ventilators and Thermostatic Heat Regulators for street cars 151 W 22nd St. Chicago



Chicago Surface Lines Car, equipped with "UTILITY" Ventilators and Compensating Intake which won the Competition Award.

ADVERTISEMENTS AS SOURCES OF NEW IDEAS

Recently the president of a large corporation stated that, in the business reading which he finds he must do to keep up to date, he invariably makes it a point to read advertisements, for there he finds concentrated, up-to-the-minute business news, skillfully told and attractively arranged.

Rest assured that, when a new invention is worth your using, the progressive manufacturer will not only place it at your disposal, but will call your attention to it in the advertising pages of your professional magazine.

Look over the advertisements in this issue of the Journal, and then ask yourself whether the time was not well spent.

AMERICAN JOURNAL
OF PUBLIC HEALTH

(Advertising Talk #2)

Public Health Clippings.

Prepared by R. R. Harkness.

The Medical Bulletin of the Lawrence County Medical Society ventures the following remarks:

The average man will give an attorney from three to five thousand dollars, together with a lifetime of praise, to keep him out of the penitentiary for from two to ten years, yet at the same time will raise a phosphorescent glow and a kick that can be heard around the world if a doctor charges him fifty or a hundred dollars to keep him out of hell for a lifetime. We are the only people under God's ethereal tent today who keep open shop for twenty-four hours a day, for three hundred and sixty-five days each year. We are also the only laborers who keep on working for people who do not pay. —*Exchange.*

*

A Vision Fair.—Two laborers of color were tapping the bottom of the ditch with their picks when one remarked:

"Tom, why doan' you leave this place an' travel. Ah wukked mah way from Frisco to New Yawk and from New Awleans to Sain' Paul. Ah's seen putty neah ev'ythin' in this country."

A dreamy look passed over Tom's face.

"Niggah," he asked, "has yoh evah had de D. T.'s?"

"No."

"Well, den," said Tom, "yoh ain't nevah seen nuthin'—nuthin' at all."—*Journal American Medical Association.*

*

Probably It Was.—"Mars John," excitedly exclaimed Aunt Tildy as she rushed panting into a fire-engine house, "please, suh, phonograph to de car cleaners' semporium an' notify Dan'l to emergrate home diurgently, kaze Jeems Henry sho' done bin conjured! Doctor Cutter done already distracted two blood-vultures from his 'pendercitis, an' I lef him now prezaminatin' de chile's ante-bellum for de germans of de neuro-plumonia, which if he's disinfected wid, dey gotter 'noculate him wid the icecoldlated quarantimes—but I b'lieves it's conjuration!"—*Richmond Times-Dispatch.—From Medical Pickwick.*

Fruit Juice Flavors

Jiffy-Jell

Flavors In Glass Vials

A New-Grade Quick Gelatine Dessert

True-Fruit Flavors

Which Tempt Dull Appetites

You will find in Jiffy-Jell your ideal of a fruity jelly dainty.

The owners of Jiffy-Jell make and control most of the highest-grade gelatine. So we always have plenty, and use nothing else, whatever the shortage elsewhere.

The maker of Jiffy-Jell is Otis E. Glidden, who has made a world-wide study of gelatine desserts.

The fruit flavors for Jiffy-Jell are all made from the fresh ripe fruit itself.

They are highly concentrated, so each Jiffy-Jell dainty has a wealth of true-fruit flavor.

Then these fruit-juice flavors are sealed in glass, so they keep their strength and freshness.

Jiffy-Jell desserts and relishes, made in midwinter, taste like fresh ripe fruit.

Mint Jiffy-Jell tastes like a garnish made from fresh mint leaves.

Lime Jiffy-Jell—with a flavor from lime fruit—makes a salad jell, tart, zestful and green.

Test Lots Free

We urge a comparison with old-time quick gelatine desserts, where the flavors come mixed with the powder. Jiffy-Jell will be a revelation. We supply physicians and hospitals with trial lots free.

As an appetizing dainty, or as carrier for other foods, Jiffy-Jell deserves a high place in every diet list.

Waukesha Pure Food Co.
Waukesha, Wis.

10 Flavors in Glass Vials
A Bottle in Each Package

Strawberry
Raspberry
Loganberry
Cherry
Orange
Lemon
Pineapple
Mint
Lime
Coffee

Rout the RAT
and Avoid DISEASE

“THE RAT MENACE”

A motion picture film educational of the grave danger of the rat to public health, and how this pest may be exterminated.

Every Health Officer should have this film.

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Manufacturers and Distributers
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Educational Films a Specialty
INDIANAPOLIS, IND.

University of Pennsylvania
COURSE IN PUBLIC HYGIENE

Courses designed for the training of men and women for public health careers were first offered by the University of Pennsylvania in 1906, and classes have been graduated each year since 1909-10.

The courses offered include public, municipal, industrial, and personal hygiene; vital statistics; sanitary engineering; building sanitation; meat and milk hygiene; practical hygiene including physical and chemical methods and bacteriology; protozoölogy; entomology; helminthology and medical zoölogy; medical inspection of schools; sanitary legislation; sanitary surveys.

The course of study extends over a full academic year. The degree of Dr. P. H. (Doctor of Public Hygiene) is conferred on all those meeting the requirements of the course.

Address all inquiries to

DIRECTOR,
LABORATORY OF HYGIENE
University of Pennsylvania Philadelphia, Pa.

Aeroplane Poison.—The curious and inquiring old gentleman fired out a string of questions at the young flying officer who had the misfortune to be in the same railway carriage with him. The young man answered the first twenty or so questions politely, but after that he got a bit tired.

“That's a terrible poison that's just been discovered, isn't it?” he asked the old gentleman at last. The old gentleman pricked up his ears.

“What is it called?” he asked interestedly.

“Airplane poison,” said the R. F. C. man.

“Is it very deadly?”

“I should say so!”

“How much would kill a person?” went on the tireless questioner.

The R. F. C. man's eyes twinkled.

“One drop!” he said. And silence reigned.—*Journal American Medical Association.*

*

Stingy.—The stingiest man in the world sued for divorce because his wife was wasteful and extravagant.

“Will you give the court some specific instances?” asked the lawyer.

“Well, one day she goes and buys three toothbrushes, one for herself and one for each of the kids. And the worst of it was we already had one good one.”—*Texas Medical Journal.*

*

Interior Decorations.—An Irish soldier coming out of ether in the hospital ward after an operation exclaimed audibly: “Thank God! That is over!” “Don't be so sure,” said the man in the next cot, “they left a sponge in me and had to cut me open again.” And the patient on the other side said: “Why, they had to open me, to find one of their instruments.” Just then the surgeon who had operated on the Irishman stuck his head in the door and yelled, “Has anybody seen my hat?” Poor Patrick fainted.—*Argonaut.*

*

A Logical Nomenclature.—“So you have twins at your house?” said Mrs. Nabor to little Jack.

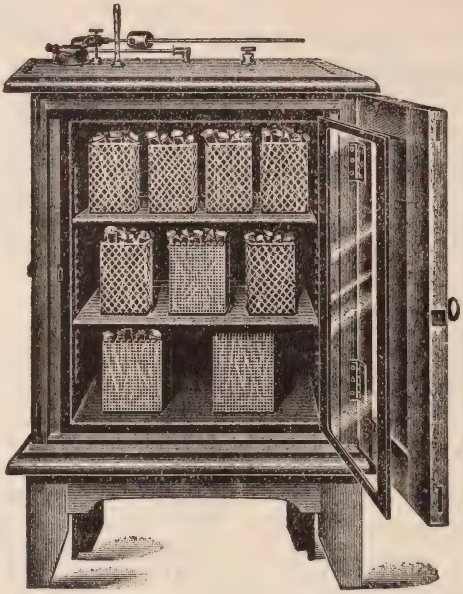
“Yessum,” he said soberly, “two of them.”

“What are they going to call them, my dear?”

“Well, I don't know for sure, but I think their names is Thunder and Lightnin', 'cause that's the names papa called them when the doctor came in and told him about them.”—*Exchange.*

HEARSON INCUBATORS

WITH HEARSON PATENT CAPSULE TEMPERATURE CONTROL FOR GAS, OIL AND ELECTRIC HEATING



No. 20740. Hearson Gas Heating Incubator

We have supplied nearly three hundred Hearson Incubators to important U. S., State, City and Hospital bacteriological laboratories throughout the U. S. Their performance has been Universally satisfactory and in view of this experience we are willing to recommend the Hearson patent capsule temperature control as being the most accurate and simple device for the uniform control of incubator temperature now on the market.

We supply them in nine sizes for gas heating, six sizes for oil heating, six sizes for electric heating, and eight sizes for low temperatures, and keep a stock on hand of the more popular sizes for immediate delivery.

Complete descriptive pamphlet sent upon request

ARTHUR H. THOMAS COMPANY

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WEST WASHINGTON SQUARE PHILADELPHIA, U. S. A.

Practical Sanitation

A Handbook for Health Officers and Practitioners of Medicine

By FLETCHER GARDNER, M. D.

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First Lieutenant Medical Reserve Corps,
United States Army; Health Commissioner of Monroe Co., Indiana.

418 pages, 6 x 9, 46 Illustrations. Price, $4.00

Second Revised Edition

Opinions of Leading Authorities

I trust that your book will have the vogue which its merits warrant. It to my mind is an indispensable book in the office of every city and state health officer.—*Harvey W. Wiley, Formerly Chief Chemist, U. S. Dept. of Agriculture.*

Certainly a book of this character should wield an important influence in creating a healthy interest in sanitary medicine, as it covers the subject from beginning to end. It tells briefly but thoroughly what has been accomplished by sanitary effort and what might be expected by a better understanding of the subject. Undoubtedly such a book should be of immense value to the sanitary expert, the ordinary doctor, and the student, and layman who acts as a health officer.—*Extract from editorial in Maryland Medical Journal.*

MAIL THIS COUPON TODAY

C. V. Mosby Co., *A. J. P. H.*
Metropolitan Bldg.,
St. Louis, Mo.

Please send me 1 copy of Gardner's "Practical Sanitation" for which I enclose my check for $4.00.

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Reportorial repartee.—The proofreader on a small Middle Western daily was a woman of great precision and extreme propriety. One day a reporter succeeded in getting into type an item about "Willie Brown, the boy who was burned in the West End by a live wire." On the following day the reporter found on his desk a frigid note asking: "Which is the west end of a boy?" It took an instant to reply: "The end the son sets on, of course."—*Journal American Medical Association.*

⚜

The melancholy youth was lying in bed entertaining his visitors with tales of the battlefield.

"Yes," he said, almost tearfully, "I have had a rough time. I was once so riddled with bullets the fellows behind me complained of the draft."—*Literary Digest.*

⚜

Inconsistent.—

"There are many inconsistent men,
But the doctor tops the lot—
He tells you you need change, and then
Takes all the change you've got."
—*Texas Medical Journal.*

⚜

Drummer Plays a Mean Trick.—An old negro was riding on the train and fell asleep with mouth wide open. A mischievous drummer came along, and, having a convenient capsule of quinine in his pocket, he uncorked and sifted it well on the old negro's palate and the root of the tongue. The old darkey, awakening, became much disturbed. He called for the conductor and asked: "Boss, is there a doctor on this here train?"

"I don't know," said the conductor. "Are you sick?"

"Yes, sir, I sure am sick. I sure am sick."

"What's the matter with you."

"I dunno, sir; but it tastes like I busted my gall."—*Texas Medical Journal.*

⚜

Needed Ventilation.—"Why is this cheese so full of holes?"

"That's all right. It needs all the fresh air it can get."—*Boston Transcript.*

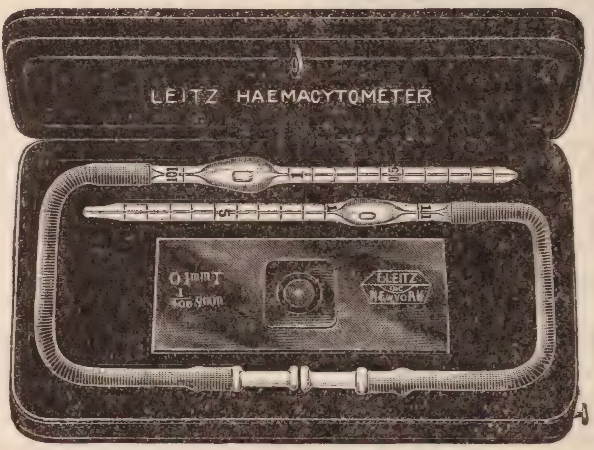
⚜

Smarty's Pain.—"Are you in pain, my little man?" asked the kind old gentleman.

"No," answered the boy; "the pain's in me."—*Exchange.*

LEITZ
BLOOD COUNTING APPARATUS

Made in U. S. A.



Reliable results in blood counting depend solely upon the accuracy of construction of the apparatus used for these tests. During the many years in which we have supplied blood counting apparatus, we have observed this feature chiefly and accordingly, **"THE LEITZ BLOOD COUNTING APPARATUS" have always been recognized as the most dependable.**

The name "LEITZ" is our guarantee

Some of the advantages are:

First—The spacing of the ruling is of the greatest accuracy.

Second—The depth of the chamber is strictly maintained.

Third—The pipettes are especially tested and those of even a slight deviation are rejected.

Fourth—The cover glasses are of the proper thickness and truly plano-parallel.

We supply Blood Counting Apparatus in single and double chambers of the following rulings:

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New York E.LEITZ INC. NEW YORK 30 E. 18th St.

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ELECTRICALLY HEATED AND REGULATED

PORTABLE WATER BATH

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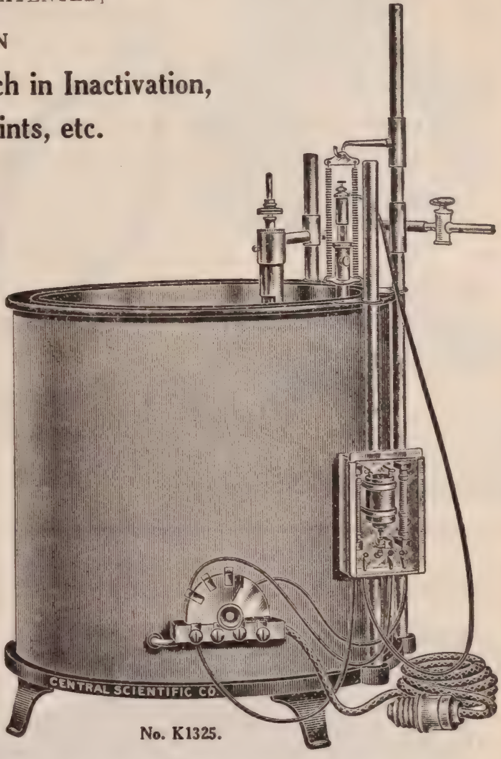
FOR USE IN

Wassermann Work, Research in Inactivation, Thermal Death Points, etc.



No. K1325.

THIS constant temperature bath is intended for use in modern bacteriological laboratories, where constant temperature is imperative. It consists of a copper container ¾ mm. (1-32 in.) in thickness, heavily nickel-plated inside and out, lagged with 25 mm. (1 in.) magnesia-asbestos (magnesia, 85%), and protected outside by a sheet of Russia iron. The bath is attached to an enameled cast-iron base, supplied with three nickel-plated rods, to which may be attached laboratory clamps for supporting flasks, etc. The bath is fitted with four electric heating units, three of which may conveniently be added one by one, by means of the switch constituting part of the bath. The fourth unit is electrically connected to the relay, which is automatically operated by a thermo-regulator.

By means of the thermo-regulator the bath can be set to any desired temperature, from the temperature of the surrounding atmosphere to the boiling point of water, with an accuracy of regulation of 1-10° C. Should a temperature higher than the boiling point be needed, the water may be replaced by "Crisco," which can be used up to a temperature of 165° C., or even higher.

For temperatures within 2 degrees of room temperature and lower, a cooling coil must be used.

No. K1325. **De Khotinsky Portable Water Bath,** 10 inches in diameter by 8 inches deep, complete with constant water level, heating units and relay for 110 volts D. C., thermo-regulator, support rods, five feet of cord and plug..............**$72.00**

For 220-volt D. C. or 110-volt A. C. current, add $2.50 to the above price. For 220-volt A. C. add $5.00. In ordering A. C. Water Bath, state number of cycles.

No. K1500. **Tray** for use with above, for 18 vaccine tubes................**$5.00**

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For full description of above, send for Bulletin No. 6G

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Improved Type

Straight Sided
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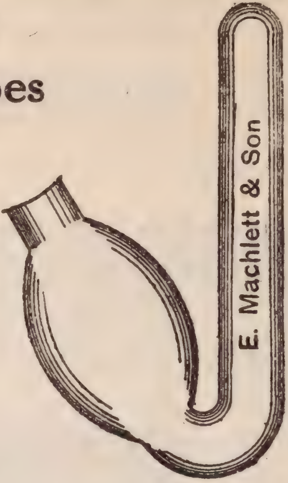

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Special Apparatus
made from
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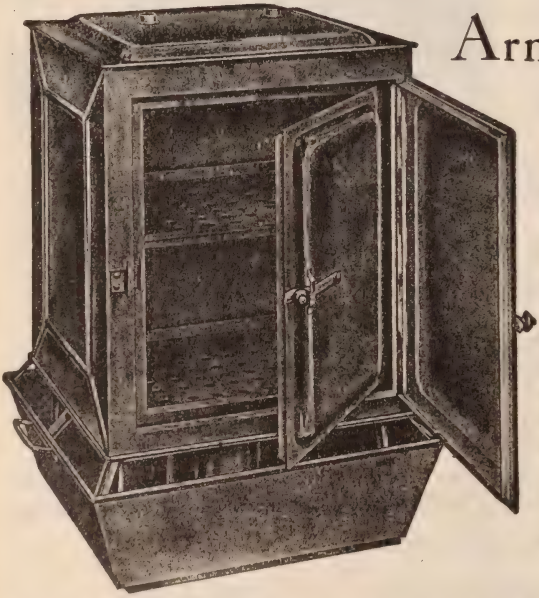

Arnold Sterilizers

Steam Sterilization at 100° C.

Patented Quick Steaming Base

BOSTON BOARD OF HEALTH PATTERN
(*Illustrated*)

This was suggested by Professor W. T. Sedgwick, and on acccunt of its many conveniences has attained a very wide popularity. Made entirely of heavy copper and has double walls and doors. A temperature of 100° C. can be maintained indefinitely without attention.

No. 638 *15½ x 12½ x 12½ in.* $60.00

There are two other patterns of Arnold Sterilizers; each is made in four sizes.

Catalog "D" sent on request.

WILMOT CASTLE COMPANY

Manufacturers: Sterling and Bacteriological Apparatus

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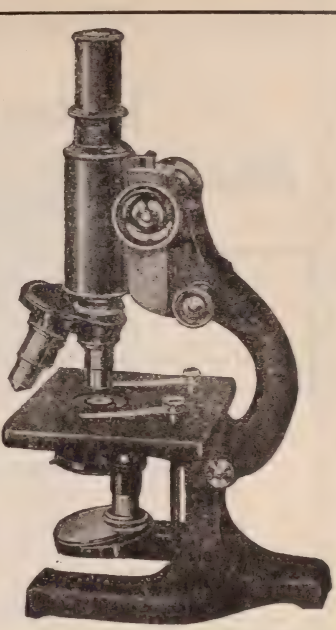
SPENCER MICROSCOPE

No. 44H

An ideal instrument for medical and laboratory use—high efficiency, excellent wearing qualities, pleasing design.

A microscope which has some very superior mechanical features as well as optical—a perfect side-fine adjustment which has **34** threads of the screw engaged at all times instead of but **one**; a **lateral travel** which indicates at all times exact position of the fine adjustment and whether or not it is approaching either limit. It has other advantages. Write for catalog.



Completely equipped for medical work
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Electric Babcock Testers

8-bottle
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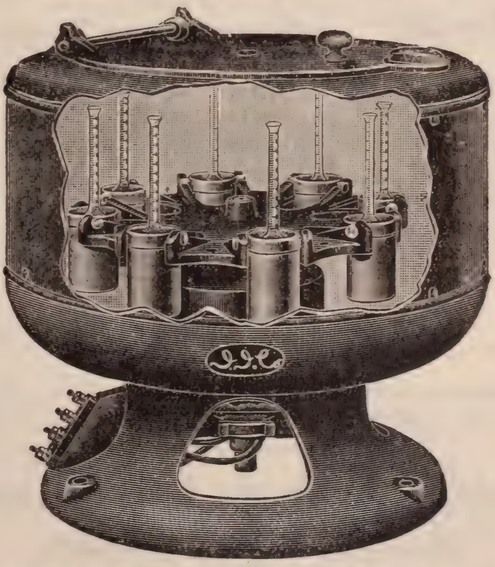

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Massachusetts Tested

INTERNATIONAL EQUIPMENT COMPANY

Send for Catalog Cp. **352 Western Avenue, Brighton, BOSTON, MASS.**

Lobar Pneumonia

Successfully Treated with Type I Antipneumococcus Serum

(One-third of All Cases of Lobar Pneumonia are Type I Infection)

Without Serum Treatment	With Serum Treatment
10%	**2%**
of *all* cases die of Type I infection	of *all* cases die of Type I infection

THE work of Neufeld, Lister, Cole and others has shown that the pneumococci causing lobar pneumonia can be classified into several distinct groups: that 80% of the cases are due to infection with Types I, II, and III; and that one-third of the pneumonia cases are caused by Type I pneumococcus. It has been shown, experimentally and clinically, that immune serum against Type I infection is highly efficient; also that immune serums for the other Type infections do not produce such effective therapeutic results.

Major Nichols, in discussing the lobar pneumonia problem in the U. S. Army, says: "The death rate in Type I cases has been reduced from over 30% to 5%. This method of treatment has passed the experimental stage, and no patient with Type I infection who dies without the early intravenous administration of large doses of Type I serum can be said to have received the best treatment."

Lederle's Antipneumococcus Serum—Type I

is standardized by animal protection tests, according to the method outlined by Cole. It is marketed in special syringe packages containing 50 cc, thus facilitating the intravenous administration of the recommended doses of 100 to 200 cc. Every package bears the date of manufacture, thus insuring the physician against the use of serum of unknown age.

PRICE $5.00 per package of 50 cc.

Literature on request.

For preventive inoculation, Pneumococcus Vaccine containing the principal types of pneumococci has been suggested by Major Nichols in the U. S. Army.

Lederle Antitoxin Laboratories

Schieffelin & Co., Distributors
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There are Two Kinds of Alleys

Clean, paved thorofares, efficiently serving for back-door deliveries.

The unpaved, foul lane used as dumping places for all that is useless and spoiled.

The concrete-paved alley needs no high board fence to shut out vistas of tin cans and broken-down ash or garbage containers because concrete encourages neatness—is an incentive to cleanly disposal of house wastes.

The unpaved alley invites the careless to pollute it with rubbish, requiring that its ugliness be hidden.

One is always dust-free, hard-surfaced and serviceable.

The other is turned into a mire by heavy rains—is a breeding ground for mosquitoes and flies—is a distributor of germ-laden dust.

One adds value to property out of all proportion to its cost.

The other is a liability to adjoining owners and to the community.

May we send you two free pamphlets, "Concrete Alley Pavements" and "That Alley of Yours?"

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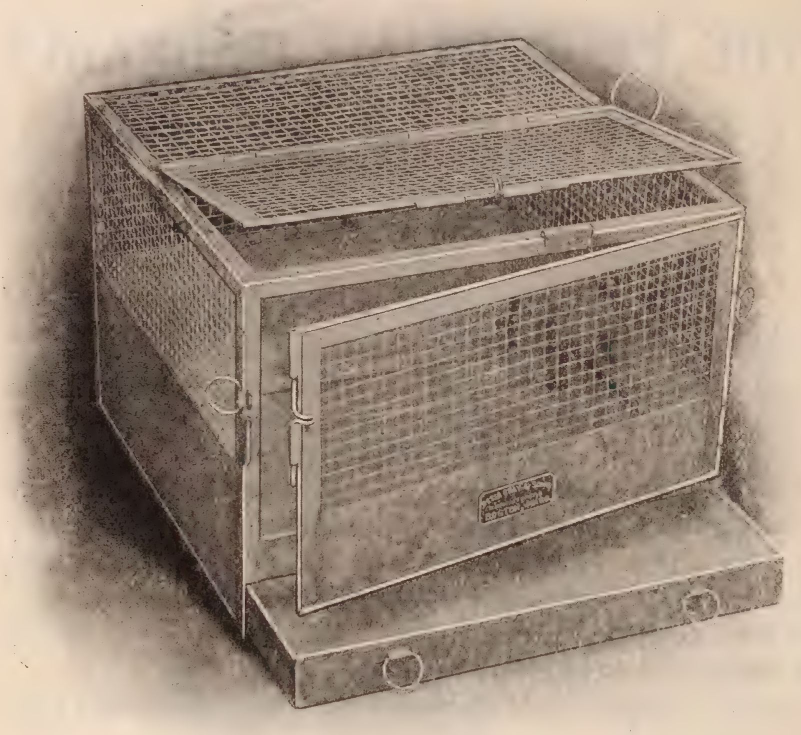

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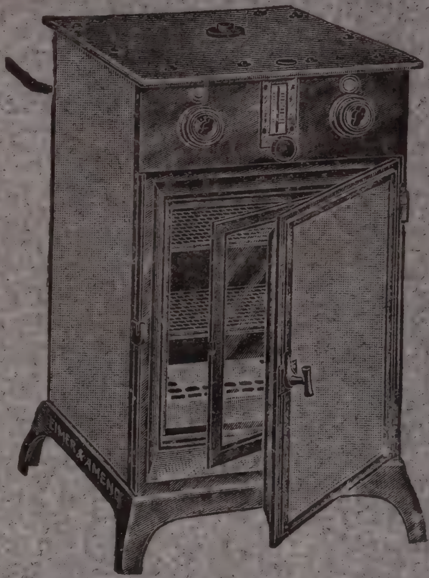

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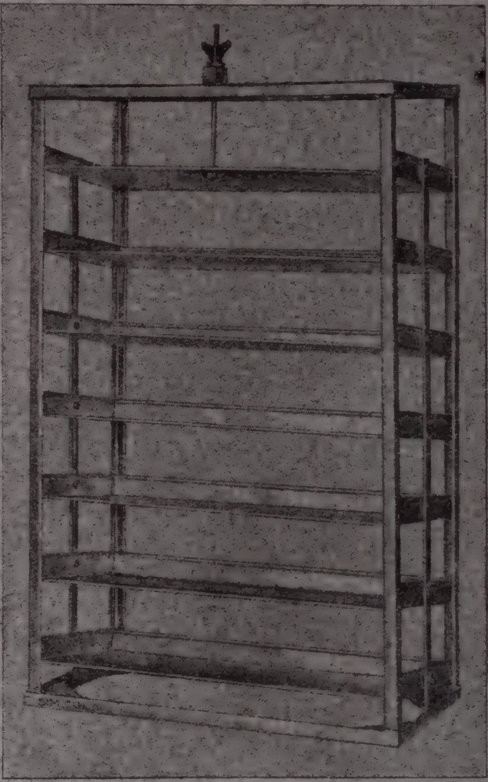

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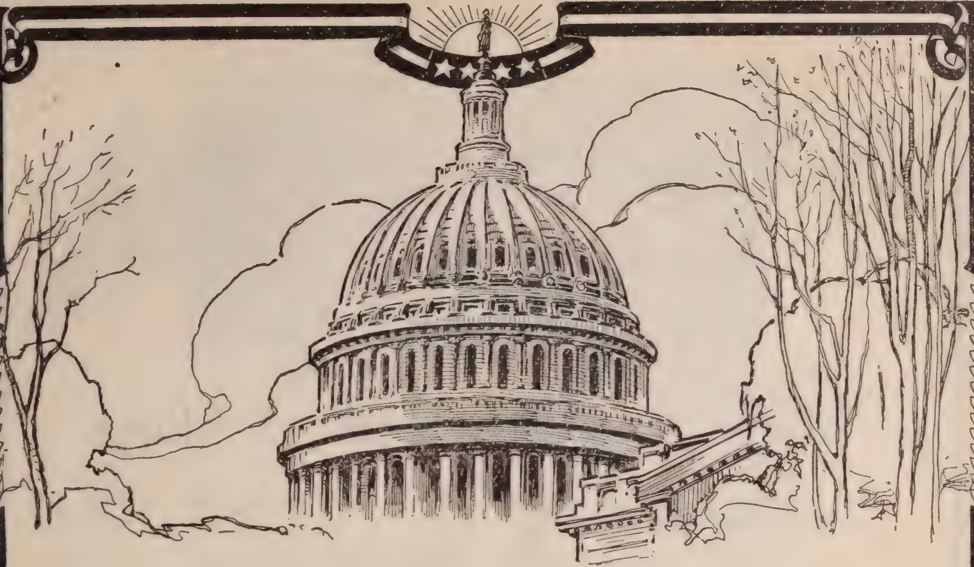

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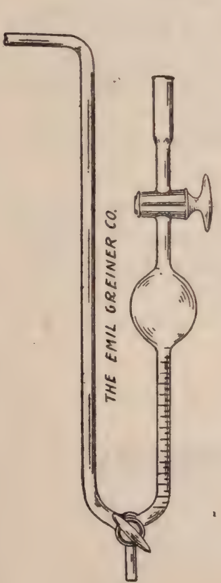

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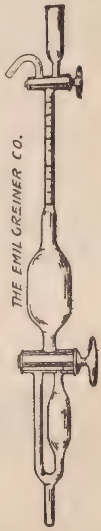

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—Je m'en vas en ville chercher de la quinine, qu'a dit le docteur, pour la petite Marie de la ferme aux Poules. Paraît que c'est un cousin qui lui donne de la fièvre. Il est venu en permission de Salonique. (*Cherchez le cousin.*)

"I am going to town for some quinine, as the doctor has ordered, for little Marie from the chicken farm. It seems that there is a cousin who gave her the fever. He is on leave of absence from Saloniki." (*Find the cousin.*)

S. S. d'État du Service de Santé M. P. A. O. — No. 13.

Some Maxims by Ade.—The following maxims were given to the soldiers at Ft. Benjamin Harrison by George Ade:

"The most helpful advice for young people is condensed into morals, maxims and proverbs. 'A bird in the hand is worth two in the bush.' Great stuff! If you had a bird in the hand you wouldn't know what to do with it. Besides, with two in the bush you're liable, with any kind of luck, to have a lot more birds after while.

"'The rolling stone gathers no moss.' Therefore, lie still and become a mossback.

"'Early to bed and early to rise,' and you will meet very few prominent people.

"Some people are good because it is expensive to be otherwise.

"A man can afford anything he can get and a woman can afford anything that she can get a man to get for her.

"You never can tell how much Bengal tiger there is in a white rabbit until you put him on a meat diet.

"Every man is the architect of his own fortunes, but the neighbors superintend the construction.

"Work is a snap. It is recreation that sends so many of our best people to the sanitariums.

"A friend who is very near and dear may in time become as great nuisance as a relative.

"If prunes cost 15 cents each they would be more popular than hot-house grapes.

"A hare-lip is a misfortune—a club-foot is a deformity, but side whiskers are a man's own fault."—*Journal American Medical* Association.

*

His Warm Reception.—Doctor—"You mustn't stay out late at night."

Patient (a married man)—"Is the night air bad for me?"

Doctor—"No; it's the excitement after getting home that hurts you."—*Medical and Surgical Reporter.*

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Lines to a Young Child.—

So, little fellow,
You have adenoids, do you?
How time flies!
Very soon, now, you will
Be big enough
So that some doctor can
Remove your
Vermiform appendix!
And then will come the dentist.
I can look back
And remember
(As if it were only yesterday)
When the only charge
The medical profession could
Prove against you was colic;
But now you are getting
To be a regular human being,
And the grand jury of physicians
Will indict you yearly
On a dozen counts.
And in the fulness of time,
If you are good,
The doctors will let you have
A comfortable middle age
Full of hardened arteries—
Child, life is before you!
Little John Doe,
Science is waiting
To find you guilty!

—*N. Y. Evening Sun.*

◆

Inoculation Day.—

My blood the surgeons fortify
With antiseptic serum;
The dread bacilli I defy—
What cause have I to fear 'em?

We form outside the pest-house door
At one o'clock precisely,
But if we get our dose at four
We think we're doing nicely.

And in our arm the surgeon stabs
A hypodermic squirter,
E'en as the hungry hobo jabs
His fork in a frankfurter.

I'm full of dope for smallpox germs,
For typhus and such evils;
For broken heart and army worms,
For chestnut blight and weevils.

I'm doped against the bayonet
Wielded by German demons;
But no one seems to think I'll get
Dear old delirium tremens.

—*A Private at Plattsburg; Jour. A. M. A.*

ADVERTISEMENTS AND THE MAN FROM MAINE.

Last summer a young man tackled his first health job as health officer of a town up in Maine. One of the things he did was to send to advertisers in various journals for the free booklets they offered. A surprising variety came: on the use of the microscope, little wrinkles about culture media, charts on dental hygiene, lists of health films, technique of blood stains, serum therapy, and so on.

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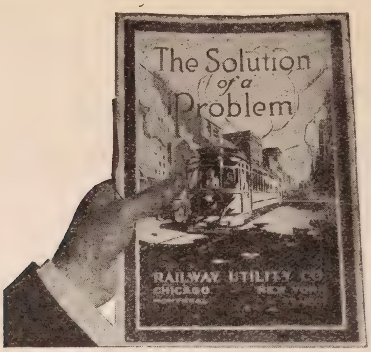

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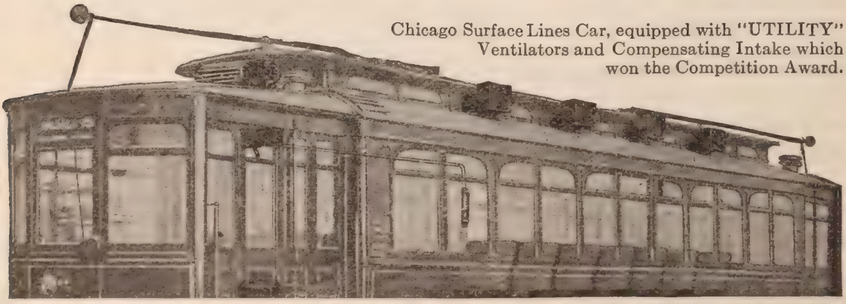

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Indignant Doctor.—"Are you sure I shall recover?" asked the patient, anxiously. "I heard that sometimes you have given a wrong diagnosis and treated a patient for pneumonia who afterward died of typhoid fever."

"You have been scandalously misinformed," said the doctor, indignantly. "If I treat a man for pneumonia, he dies of pneumonia."—*Texas Med. Jour.*

◆

An Ounce of Prevention.—Dr. Brown was a phlegmatic man who usually took his own time at answering even urgent calls, but one day he bustled around in a great hurry.

"Mrs. Weaver has sent for me to come and see her boy, and I must go at once," he said.

"What is the matter with the boy?" asked the doctor's wife.

"I don't know," he said, "but Mrs. Weaver has a book on 'What to Do Before the Doctor Comes,' and I must hurry up before she does it."—*Southern Medical Journal.*

◆

On a Bottle.—A worthy St. Louis doctor, while enjoying a holiday in the country, took the opportunity along with a friend to go fishing. During operations the doctor's sinker came off and was lost. Here was a dilemma—no sinker, no more fishing that day. Ha! Happy thought; he had a bottle in his pocket! The bottle was filled with water, carefully corked and sent down on its mission.

After a few minutes' interval, the doctor had "a bite," and pulled up his line at racing speed, finding a fine pair of fish, one on each hook.

"Ha! doctor, twins this time!" exclaimed his companion.

"Yes," quoth the doctor; "and brought up on a bottle, too."—*Doctors and Patients.*

◆

A Dependable Guide.—Friend—"What is the first thing you do when a man presents himself to you for consultation?"

Doctor—"I ask him if he has a car."

Friend—"What do you learn from that?"

Doctor—"If he has one, I know he is wealthy—and if he hasn't, I know he is healthy."—*Buffalo Courier.*

◆

The Right Place.—Doctor (to operetta diva who wishes to be vaccinated):—"Shall I vaccinate your arm?"

Diva:—"Heavens! No, of course not. Think of me as an artist with a scar on my arm! You must vaccinate me where it won't show."

Doctor:—"I think you had better take it internally."—*Doctor's Leisure Hour.*

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Hear! Hear!
The germs are near;
Pneumonia taints the breeze.
It enters and grows
In the mouth and the nose,
And spreads through a cough and a sneeze.
—*Texas Bulletin.*

⁂

A Musical Solo.—Doctor.—That must have been quite an interesting case you had in there?

Nurse.—Yes, Mrs. Lorrey just gave birth to a 13-pound boy.

Doctor.—Was it instrumental?

Nurse.—No, vocal.

—*Jour. A. M. A.*

⁂

He Called It Wrong.—"Any complaints, corporal?" asked the colonel, making, one morning, a personal inspection.

"Yes, sir. Taste that, sir," said the corporal.

"Why," the colonel said, "that's the best soup I ever tasted."

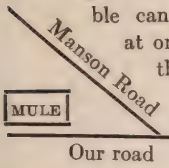
"Yes, sir," said the corporal, "and the cook wants to call it coffee."—*Boston Transcript.*

⁂

A Legitimate Kick.—The following appeal was received by the county physician at Chelan, Wash., who forwards it:

Dear Sir:—On or about Nov. 14, 1917, Mr. G. M. Briggs of Chelan lost a mule (it died) he dragged it out west of town about ½ mile from the city limits, buried it about 50 feet from the Manson Road and very near our private road, after it was covered the 2 feet stuck up 6 or 8 inches above the earth, I reported it to the Sheriff W. E. Gurr of Chelan, the next day Mr. Briggs came out with a *meat saw*, the feet are not in sight now, but smell *my Oh my* is terrible can you please attend to this at once and oblige all travelers on these two roads.

Very Respectfully
Mrs. L. H. Spader.



—*Jour. A. M. A.*

⁂

Drops in Baby's Eyes.—
All good doctors great and wise
Are using in the baby's eyes
A prophylactic to prevent
The baby's vision being spent.

Regardless of its rank or size
We put the drops in baby's eyes.
Just one thing more we beg to mention,
Please give these babies prompt attention.
—*Ohio Public Health Journal.*

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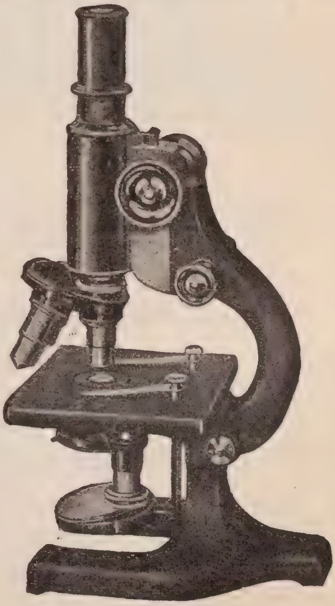

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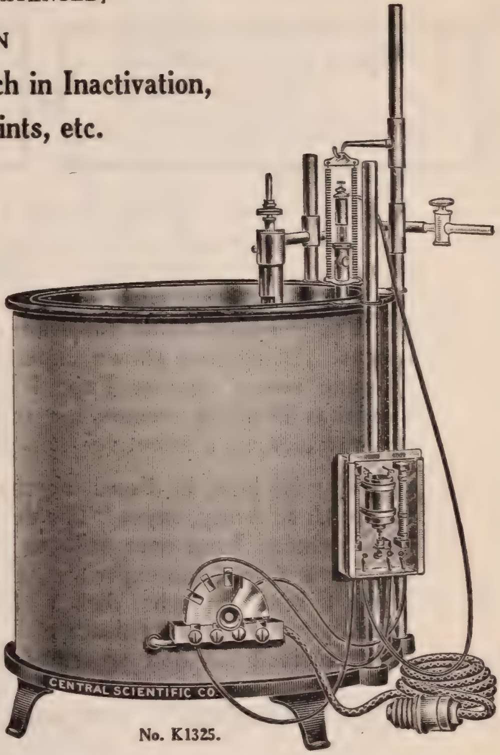

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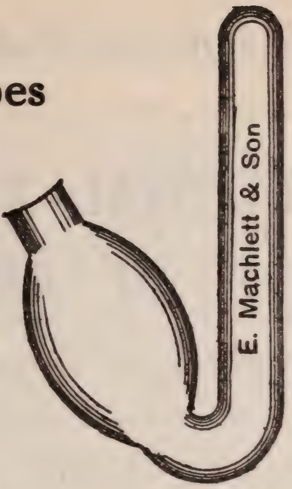

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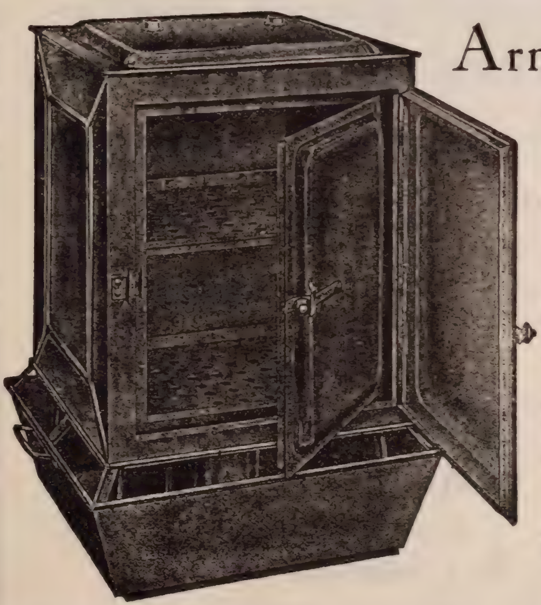

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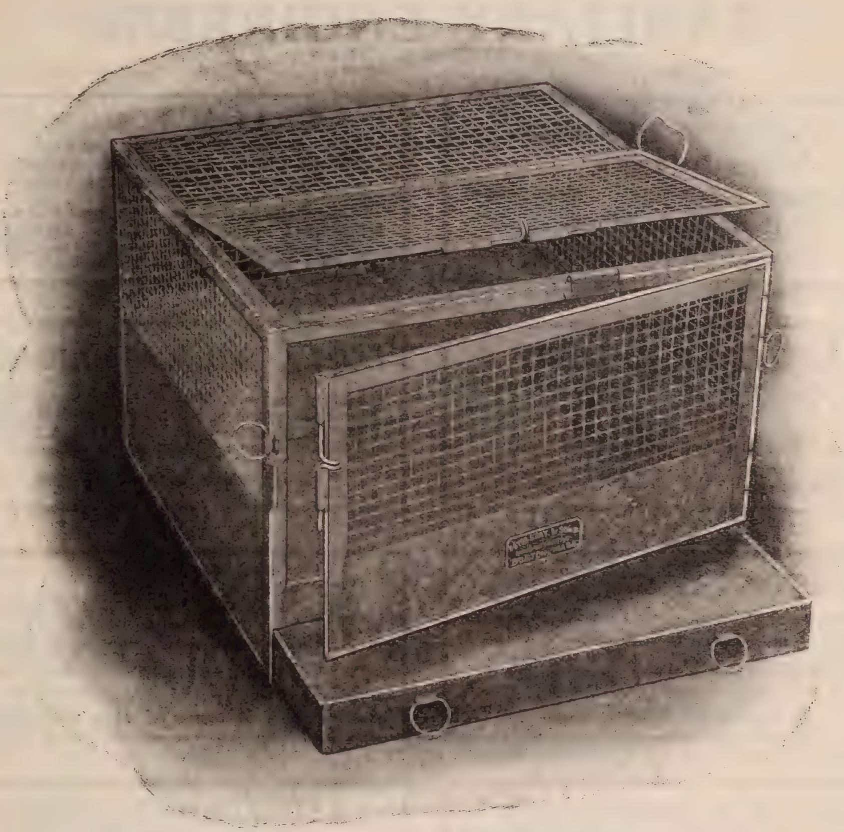

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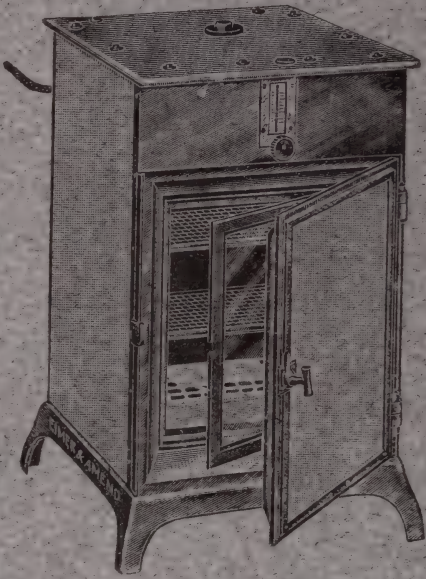

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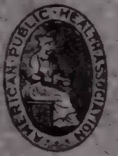
Vol. VIII. MARCH, 1918. No. 3.

AMERICAN JOURNAL *of* PUBLIC HEALTH

THE JOURNAL OF THE AMERICAN PUBLIC HEALTH ASSOCIATION



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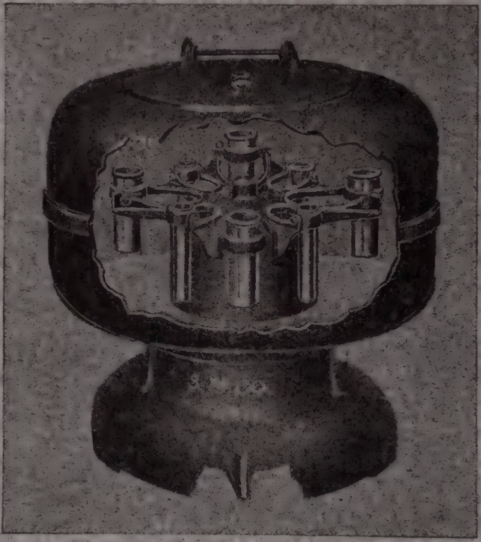

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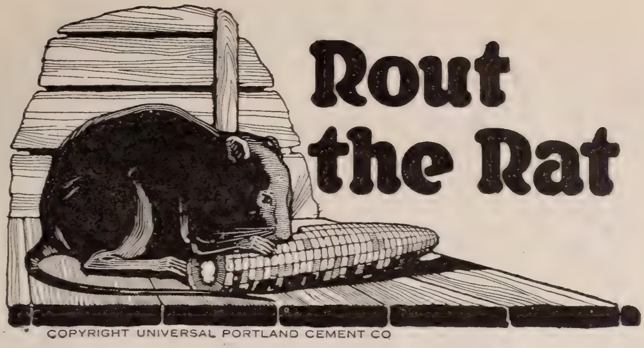

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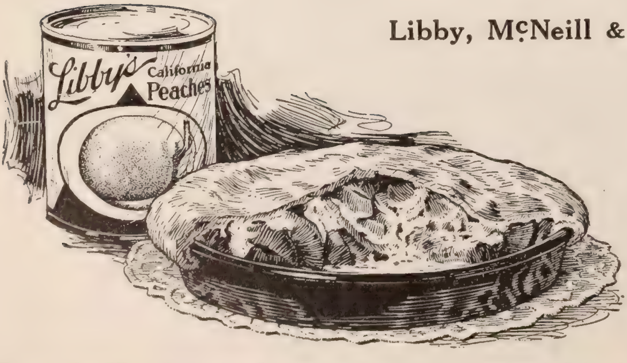

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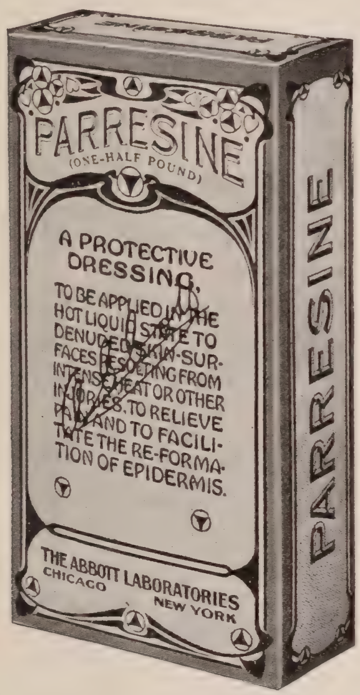
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American Journal of Public Health

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Horlick's Malted Milk Co., Racine, Wis.

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Antipneumococcic Serum Polyvalent Mulford, is standardized by animal protective tests against Type I. Pneumonia caused by this type has proven most amenable to serum treatment. One mil of the serum must protect against 500,000 fatal doses of Type I culture. Possessing, as it does, the same protective power against Type I and also antibodies for Types II and III, **we believe it is therefore the logical serum to use.**

Type diagnosis is desirable, but requires time and proper facilities. In those cases where delay is to be avoided or where the diagnostic facilities are lacking, it is usually good routine practice to administer at once the Antipneumococcic Serum Polyvalent.

During the time the U. S. troops were stationed along the Mexican border, Antipneumococcic Serum Polyvalent was used extensively and is now being employed with excellent results in the U. S. Army and Navy Service.

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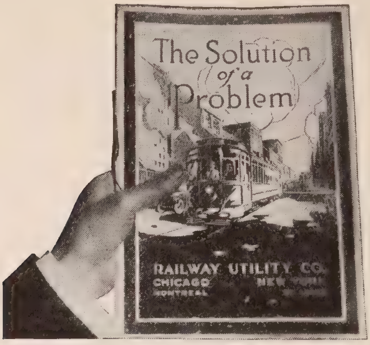

It not only describes the best method of ventilation, but also the most efficient way to heat street cars.

It is a booklet that Public Health Officials will find of value in helping them solve their traction problems.

It also shows how tremendous savings can be effected in electrical energy, and

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It will be sent you without charge or obligation. Full of valuable information with test data, charts, formulae, and photographs. *WRITE FOR A COPY.*

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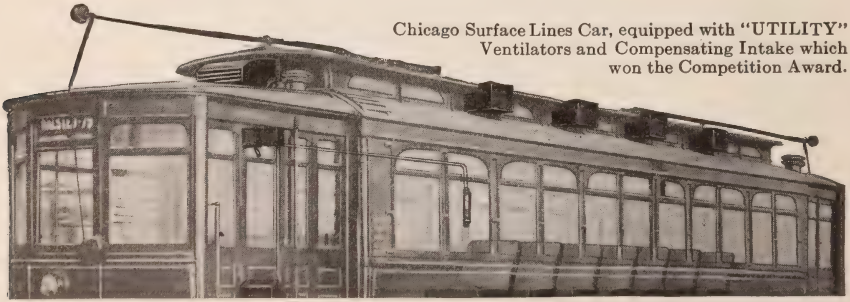

Chicago Surface Lines Car, equipped with "UTILITY" Ventilators and Compensating Intake which won the Competition Award.

Hunka Tin.—
You may talk about your voitures
When you're sitting round the quarters,
But when it comes to getting blessés in,
Take a little tip from me,
Let those heavy motors be,
Pin your faith to Henry F.'s old Hunka Tin.
Give her essence and l'eau,
Crank her up and let her go,
You back firin', spark-plug foulin' Hunka Tin.

The paint is not so good,
And no doubt you'll find the hood
Will rattle like a boiler shop en route;
The cooler's sure to boil,
And perhaps she's leakin' oil,
Then oftentimes the horn declines to toot.
But when the night is black,
And there's blessés to take back,
And they hardly give you time to take a smoke!
It's mighty good to feel,
When you're sitting at the wheel,
She'll be running when the bigger cars are broke.

After all the wars are past,
And we're taken home at last,
To our reward of which the preacher sings,
When these ukulele sharps
Will be strumming golden harps,
And the aviators all have reg'lar wings,
When the Kaiser is in hell,
With the furnace drawing well,
Paying for his million different kinds of sin,
If they're running short of coal,
Show me how to reach the hole,
And I'll cast a few loads down with Hunka Tin.

Yes, Tin, Tin, Tin,
You exasperating puzzle, Hunka Tin,
I've abused you and I've flayed you,
But, by Henry Ford who made you,
You are better than a Packard, Hunka Tin.
—*American Field Service Bulletin*, Paris.

◆

Muffle the Sneeze.—The Sneeze converts a person into a Human Atomizer, expelling millions of germs.

If afflicted with cold, grip or pneumonia he vigorously spreads his disease wherever he sneezes.

His cough also needs a Muffler, for the lack of which we have so much consumption.

If it's against the law to open the Cut-out on your auto, which can only create a nuisance, it ought to be unlawful to open the Cut-out on your head and spread disease.—*Exchange.*

IF THE MAYOR SHOULD
SAY TO YOU:

"Well, Doc, the City Council has finally voted to look into that idea of yours to filter the water supply. Now, then, can you give us the names of some dependable, four-square engineers to make a report for us?"

What would you do?

Why, of course, you'd turn to the Directory of Engineers, etc., in the Journal, and give him the list.

You would also use the Directory if you needed the services of a private laboratory. Incidentally has it occurred to you that it may often be cheaper to have unfamiliar, emergency analyses made elsewhere rather than to putter away on isolated determinations yourself?

Turn to the Directory on pages XXVIII and XXIX of this issue. You may need the help of these men.

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OF PUBLIC HEALTH

(Advertising Talk #4)

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A Bottle in Each Package

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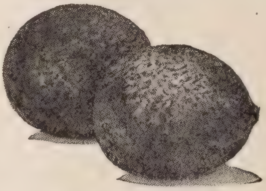

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Good Food on Dirty Dishes.—If cooking is an art, then dishwashing is a science. Unfortunately, many of our restaurants practice neither art nor science, even though most people are willing to sacrifice a small degree of art for the benefit of science. It is not stimulating to one's æsthetic senses to see dirty dishes hurriedly dipped into greasy dishwater and used for serving food, without proper scalding or drying, nor is it good practice from the public health standpoint. Furthermore, the best of food may be wasted if served on dirty dishes. It would seem that many restaurants must be under constant supervision as a reminder that good dishwashing is of equal importance with good cooking.—*California Monthly Bulletin.*

* * *

"The great work of sanitary reform has been, perhaps, the noblest legislative achievement of our age, and, if measured by the suffering it has diminished, has probably done far more for the real happiness of mankind than all the money questions that make and unmake ministries."—Lecky.

* * *

The Greater War.—"In the various nations engaged in this war, in times of peace, over 6,500,000 die annually from preventable diseases. There have been fewer than 7,000,000 killed in action on all sides since the outbreak of war. Obviously, then, all the battles in the interest of humanity and the interests of nations are not fought in the firing line. The perennial warfare waged against the invisible foe is as important—if not more so—than that now waged against those who are threatening the destruction of the very principles of civilization."—Chas. J. Hastings, M. D. (*Toronto Bulletin*).

* * *

Tuneful Tonsil Talk.—

Mary had a little cough,
  Its bark was loud and sneezy
And everywhere that Mary went,
  That cough was always wheezy.

It went with her to school, of course,
  And met the school physician,
Who found her adenoids were large,
  According to his mission.

But now those horrid adenoids,
  Her cough and tonsils vicious,
Repose upon the doctor's shelf,
  And Mary feels delicious.
    —*Kansas State Bulletin.*

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The Bacteriological Ball.—
A gay bacillus to gain her glory,
Once gave a ball in a laboratory.
The fete took place on a cover glass,
Where vulgar germs could not harass.
None but the cultured were invited,
For Microbe Chicks are well united.
They closely shut the ballroom doors
To all the germs containing spores.
The staphylococci first arrived,
To stand in groups they all contrived.
The diplococci came in view,
A trifle late and two by two.
The streptococci took great pains,
To seat themselves in graceful chains.
The pneumococci stern and haughty,
Declared the gonococci naughty.
And said they would not come at all
If the gonos were present at the ball.
The fete began, the mirth ran high,
With not a fear of danger nigh.
Each germ enjoyed himself that night,
Without a fear of a phagocyte.
'Twas getting late and some were loaded,
When bang! the formaldehyde exploded;
And drenched that happy dancing mass
That swarmed the fated coverglass.
Not one survived but perished all,
At that bacteriological ball.
—*Anon.—Jour. A. M. A.*

*

Probably Not.—Breathes there a girl on earth today, with hair that's slowly turning gray, who in the mirror scans her head and ne'er unto herself hath said, as she lets out a soulful sigh, "I really think I ought to dye"?—*Cal. Med. Jour.*

*

A Confession.—

I am a murderer!

I play a safe game. I scatter deadly disease germs in halls, in the street cars, wherever there is a crowd.

Few people suspect me. I am never detected.

I kill babies, children, grownups, impartially. Hundreds of hospitals are filled with those I do not succeed in slaying.

Thousands of graveyards are filled with those with whom I have more success. I am ruthless and cruel.

Yet I could be restrained if people really understood how much harm there is in me.

Instead of that they think I am funny and laugh at me.

Some of them even cry the German word for "health" when they hear me.

For I am a SNEEZE!—Yavapai.—*Arizona Health Bulletin.*

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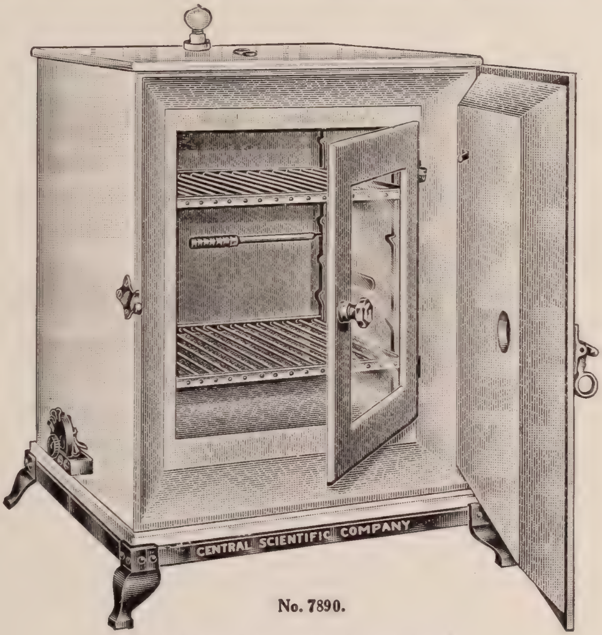

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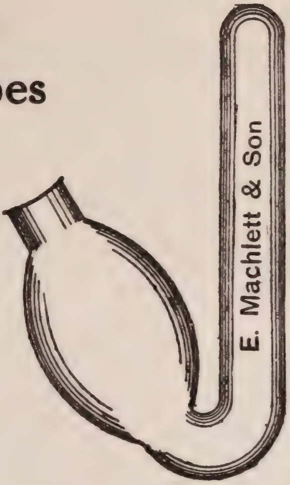

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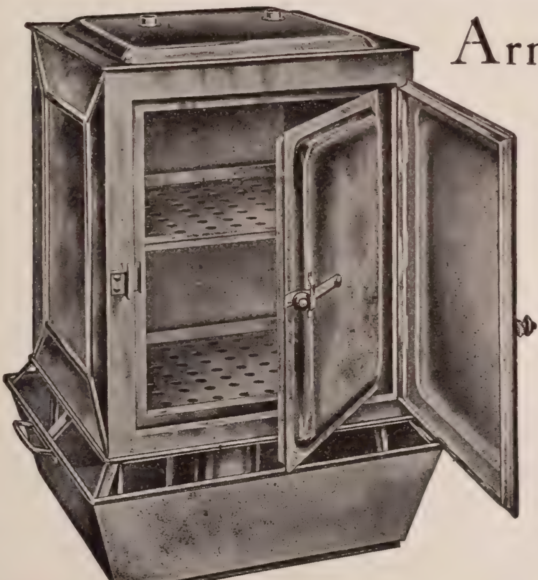

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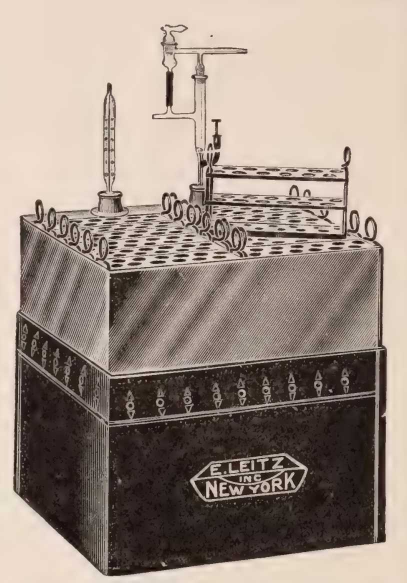

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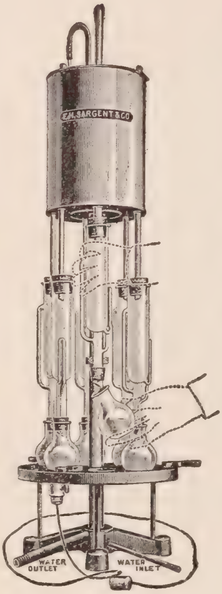

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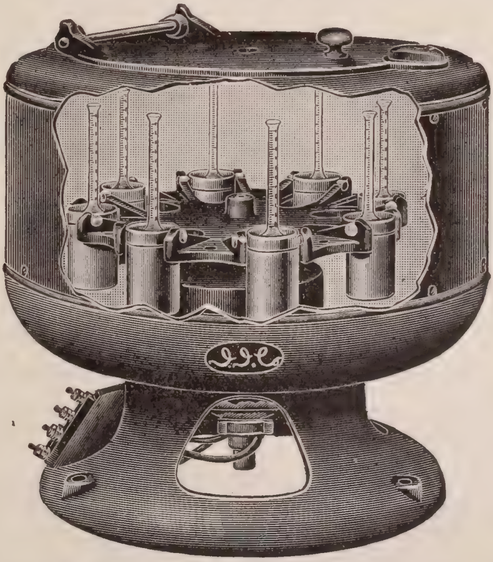

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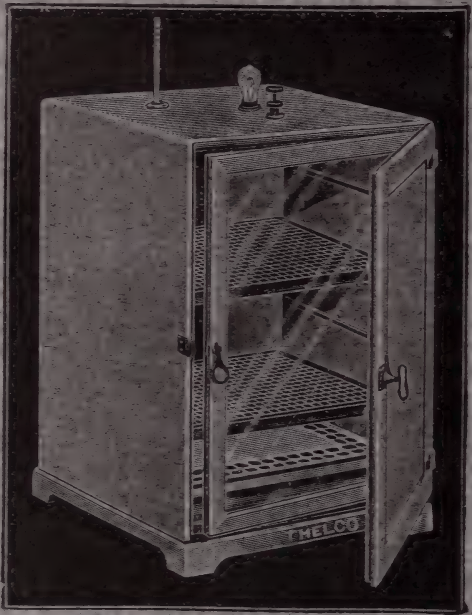

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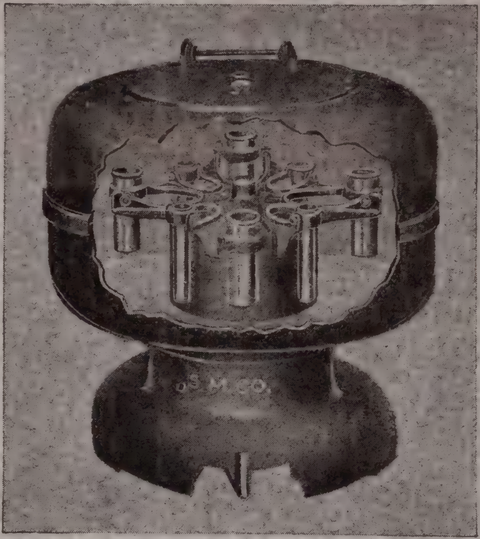

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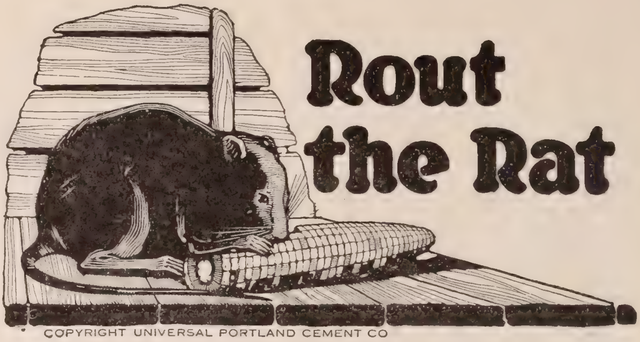

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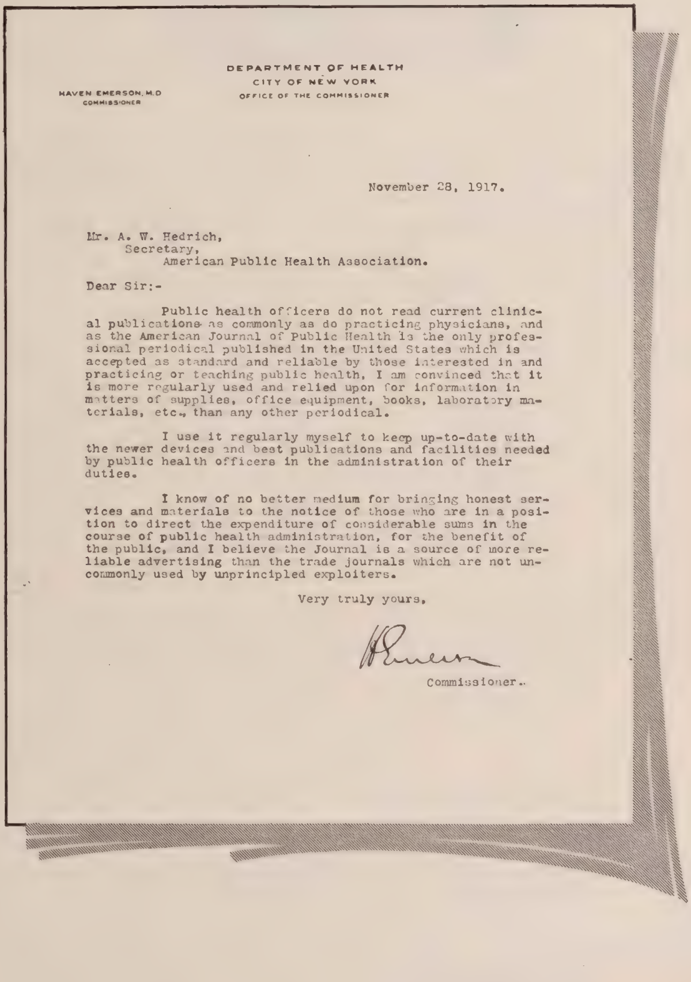

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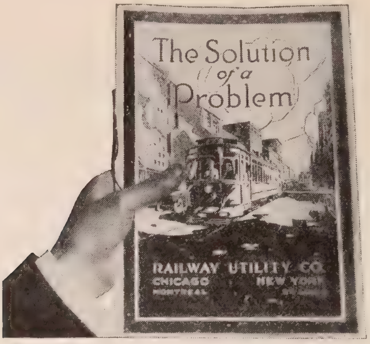

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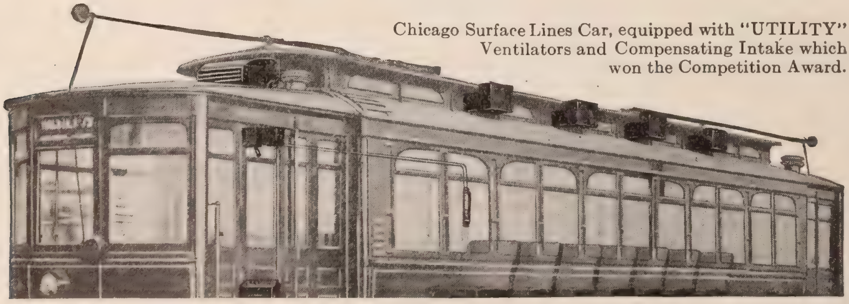

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⁂

"Don't cry over spilt milk. Very probably it was full of germs."

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"Troubles are like babies. The more you nurse them the larger they grow."—The Cannery Notes.—*Bulletin, Penna. Dept. of Ag.*

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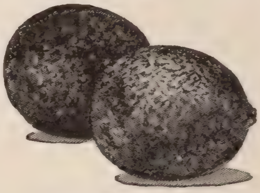

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—Life.—Cincinnati Sanitary Bulletin.

*

A Logical Wish.—On the outskirts of Philadelphia is an admirable stock farm. One day last summer some poor children were permitted to go over this farm, and when their inspection was done, to each of them was given a glass of milk. The milk was excellent. It came, in fact, from a two-thousand-dollar cow.

"Well, boys, how do you like it?" the farmer said, when they had drained their glasses.

"Fine!" said one little fellow. Then, after a pause, he added: "I wish our milkman kep' a cow."—*Jour. A. M. A.*

*

A Double Dose.—"Mandy, I'se a sick man," said Jake, looking very miserable. "At de horspittle dey says I'e got berkerlosis."

"All right, Jake, we'll take keer of you, and git rid of dat berkerlosis."

A week later Jake stumbled in, more woebegone than ever.

" 'Tain't no use, Mandy, nary bit of use. I ain't never gwine git well. De doctors say dis morning I got two berkerlosis."—*E. M. G.* —*Texas Medical Journal.*

SCHOOL OF HYGIENE AND PUBLIC HEALTH
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JOHNS HOPKINS UNIVERSITY

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At evening, when we heat the milk for which our darling cries,
We watch her put it swiftly down with fond and loving eyes.
And then we go to bed, but not to sleep a single wink,
Ah, no! we lie awake till morn and think and think and think.

Suppose the cow who gave the milk was suffering from mumps!
Suppose the farmer had forgot to sterilize his pumps!
Suppose—ah, dreadful is the thought that grips like iron bands!
Suppose the hired man had scorned to manicure his hands!

Suppose the grass had grown too rank; suppose the creek was green;
Suppose the dairy was not washed that morning, white and clean!
These are the fears that fill with woe life's variegated page
When baby's had a drink of milk of unknown parentage.

—George Fitch, Peoria *Herald-Transcript.—Jour. A. M. A.*

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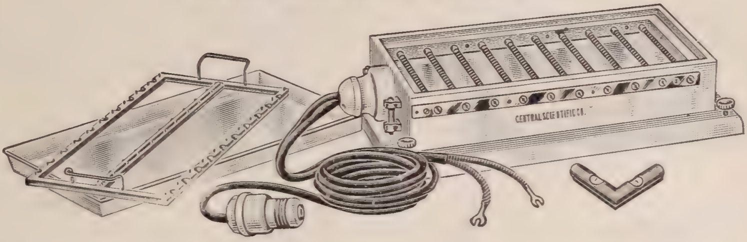
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This apparatus provides a clean and neat device for hot staining and fixing. By its use it is possible to fix the smears of sputum, etc., without danger of burning, to stain them without danger of boiling the carbolfuchsin solution and also to avoid dropping carbolfuchsin over the laboratory tables and floors. It consists of an asbestos wood frame with a base which will stand red heat without destruction. In the bottom is a sliding metal shelf, to be filled with sand for catching any drippings and to aid in reflecting all the heat upward from the heating units, of which there is one for every two slides. These units, which are easily replaceable, are wound with nichrome wire, which is insoluble in boiling carbolfuchsin. The slide carriers are nickel-plated brass frames, made to fit in the asbestos frame at a suitable height above the electrical units. The base is provided with leveling screws. A set of fuses is placed on the apparatus, so that there is no danger from accidental short circuit. The apparatus is made in two sizes, as listed below, and is intended for standard 3x1-in. slides. It consists of heating box, slide carrier, tray, cross test level and five feet of asbestos covered cord and two plugs. For 110 or 220 volts A. C. or D. C., and furnished with a rheostat for close regulation of heat.

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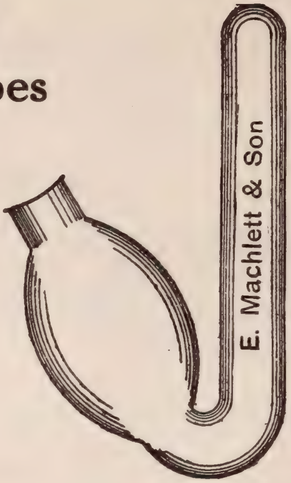

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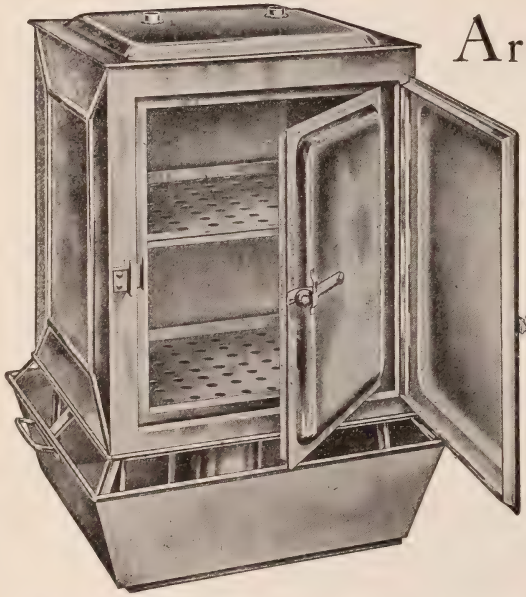

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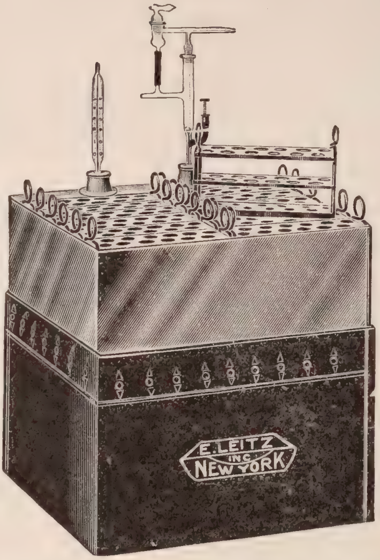

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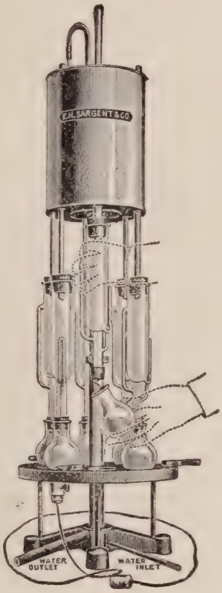

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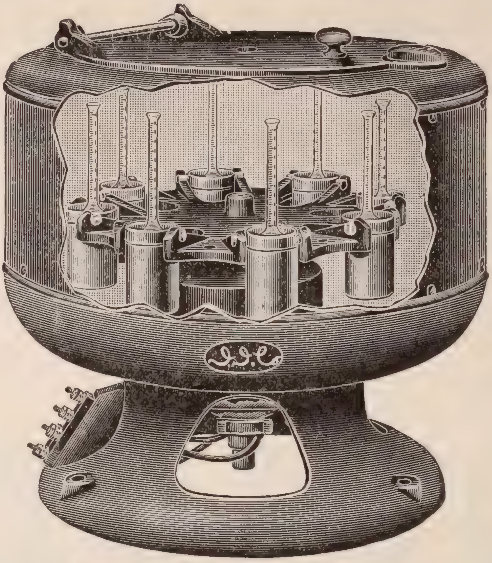

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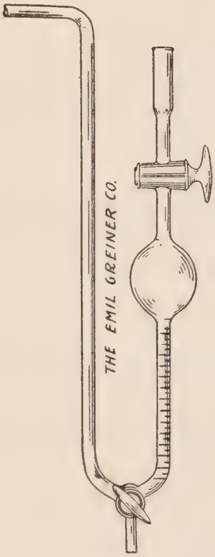
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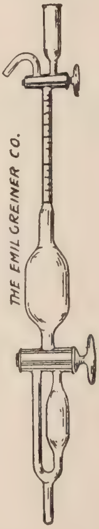
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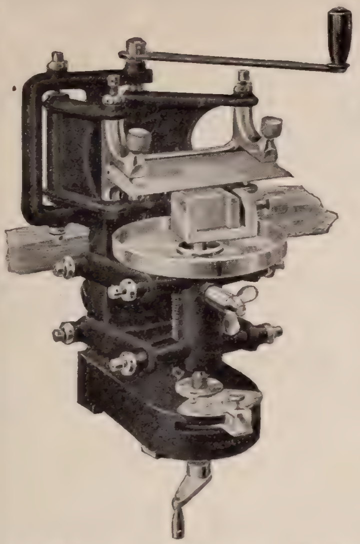

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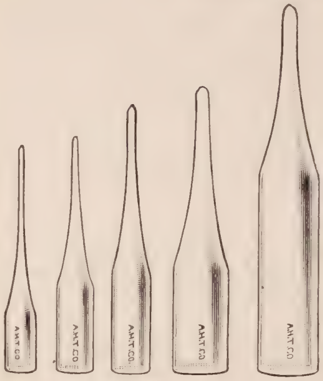

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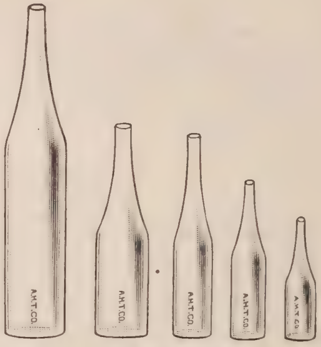

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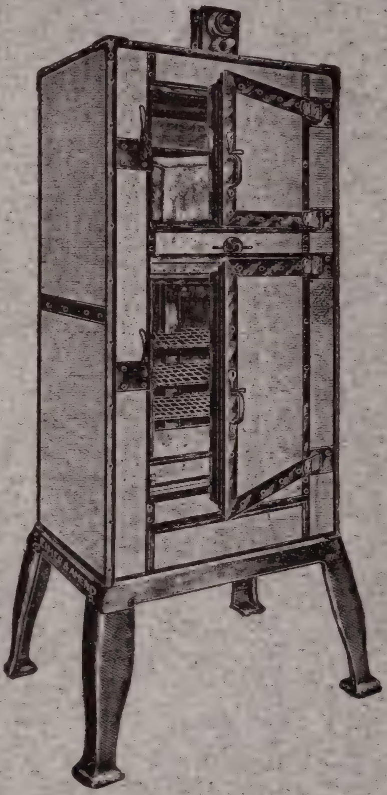

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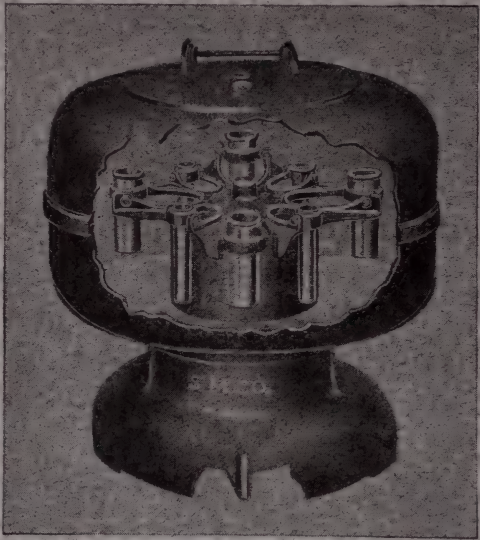
CHICAGO, ILLINOIS, OCTOBER 14-17, 1918



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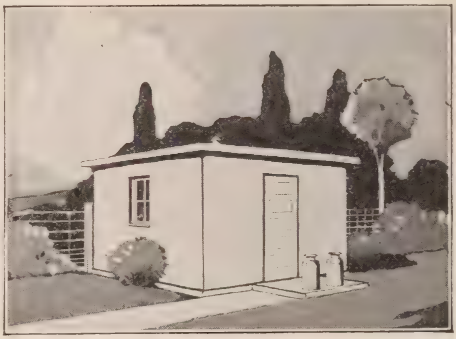

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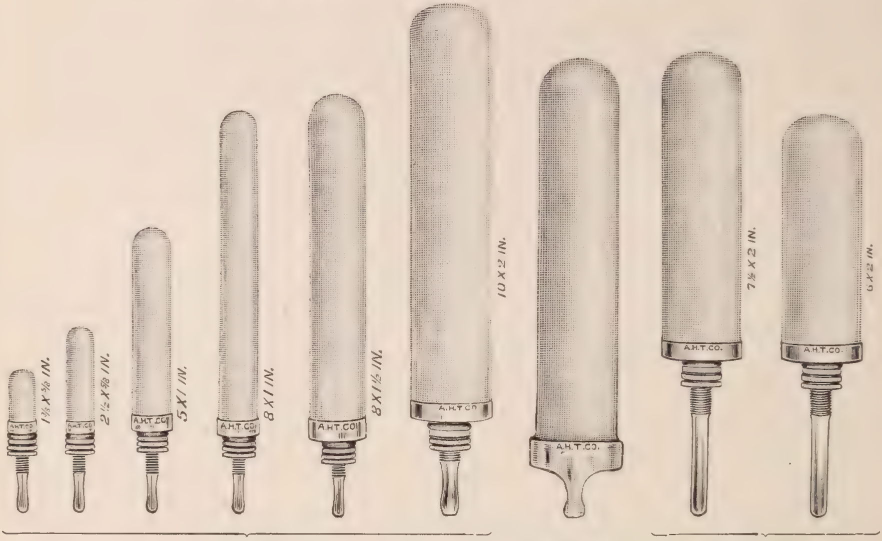
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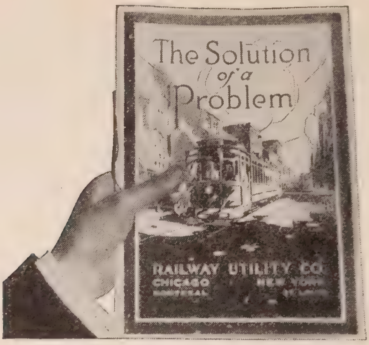

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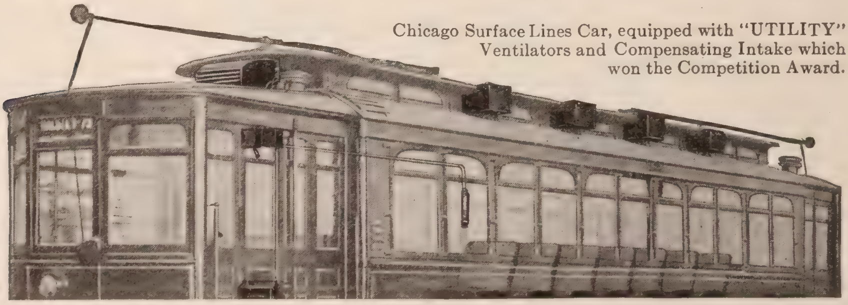

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Public Health Clippings.

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To me, the tragedy of this earth is a diseased child. The natural inheritance of a child is joy and strength and growth and freedom. He is robbed of it all by disease. To me, the most tragic indictment of civilization is a diseased child—civilization that stands still and lets a little child through ignorance of his parent or teacher or any other cause, be robbed of this divine inheritance of the joy and happiness of childhood—of the strength and growth of childhood! Medical inspection is intended to prevent that tragedy—to help remove that terrible indictment against our Christian civilization. The physician and the teacher are necessarily the main agencies in this work. Medical inspection, then, opens a new door of larger service to childhood, to civilization and posterity.—Dr. J. Y. Joyner, in an address before the State Medical Inspectors, Raleigh, N. C.

* * *

Unusual and Rash.—Private Butternut—What's your horse's name?

Private Hickory—Vesuvius!

Private Butternut—Why? Because he is so fiery?

Private Hickory—Naw—because he is covered with eruptions. Giddap, Vesuvius.—*Wadsworth Gas Attack.*

* * *

So to Speak.—Pullman Passenger—Well, Rastus, I hear that Uncle Sam is now in charge of your sleeping-car.

Porter—Yes, sah; Ah knew sooner or later we was going to get this here berth-control.—*Judge.*

* * *

In Fly Time.—A Washington man went for his vacation to a fly-haunted hotel in Connecticut. There was a hammock in the grove behind the hotel, and one afternoon our friend climbed into it with pipe and book. But the flies tormented him unmercifully, so he climbed out again in disgust.

"Look here, landlord," he complained, as he entered the office, "what's the good of a hammock in such a fly-ridden spot as that grove?"

"Oh," said the landlord, "you didn't use the hammock during hammock hours."

"What are hammock hours?" asked the guest.

"Twelve to two, sir," said the landlord. "You'll find no flies in the grove then, sir."

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The Goat.—The milk-man and the coal-man lived side by side.

The coal-man owned the goat—a patriarch, unbathed. The goat smelled to high heaven—and to the dairy next door; in fact, the milk-man claimed that part of the smell reached the ultimate consumer *via* the milk-route.

The coal-man returned that the odor wasn't half bad, once you got used to it; furthermore, he said, every seasoned stable man knew that a good smelly goat was a great preventive against stock-diseases, from farcy to milk-leg.

I was health officer.

The milk-man commissioned me to buy the goat, if possible, and dispose of him. I managed to buy him for five dollars, and locked him up for the night in the city dog pound. The next morning, the goat was back home, and the pound-fence had a great hole.

Then I made a present of the goat to a policeman whom I didn't like. The latter appeared the next day with blood in his eye. The goat had dug up a vegetable garden during the night, gnawed the bark off a valuable cherry-tree, and was munching away at the basement plumbing when detected.

The goat had been traded off to a farmer, when I left that city.

I expect to hear from that goat again. He has a career before him. When it comes my turn to go over there, who shall say that I may not find him gassing the *boche*, while patiently nibbling the trimmings off an enemy tank.

(*A. W. H.*)

* * *

The Typhoid Fly.

Winter lays its garments by:
Here we come, the Spring and I,
  Let me introduce myself:
Gentlemen, the Fly.

Busy agent of our firm,
Ready for the summer term;
  Let me introduce my pal—
Gentlemen, the Germ.

Let us enter, if you please,
We'll deliver, at our ease,
  Our supreme commodity—
Gentlemen—Disease.

—*Exchange.*

* * *

Germany's effort to expand makes one think she is suffering from room-mania, but most likely her regrets after the war will be rue-mania. —*Jour. A. M. A.*

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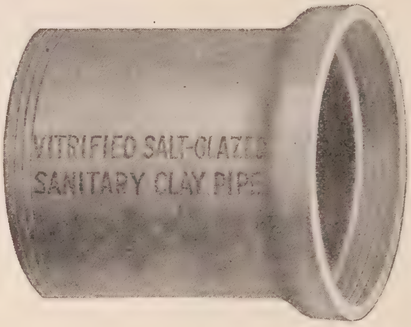

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* * *

I deal with certain little invertebrata: animals which work in darkness and in stealth, little animals which in times of peace we politely ignore, yet little animals which in times of war may make or unmake an army corps. As that wise old Greek, Aristotle, wrote—and he knew quite a lot about them—"One should not be childishly contemptuous of the study of the most insignificant animal. For there is something marvelous in all natural objects."—A. E. Shipley: "The Minor Horrors of War."

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(2) In human beings? Absolutely nothing. I do not know a single disease of human beings which has had its ravages checked, abated or abolished by any work ever done by the anti-vivisectionists.

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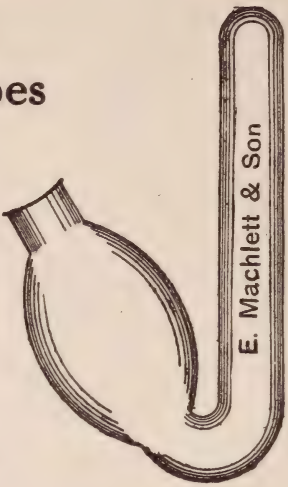

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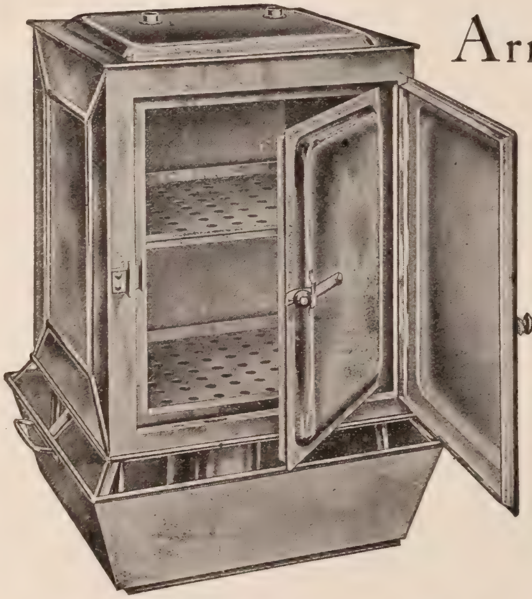

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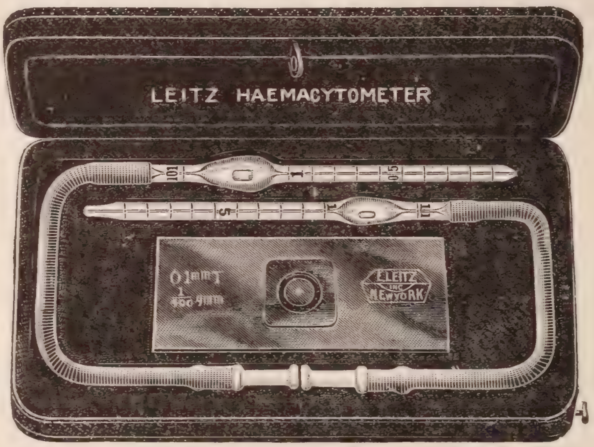

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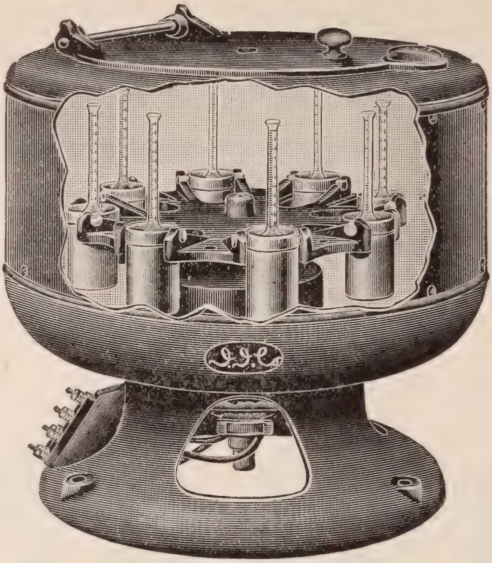

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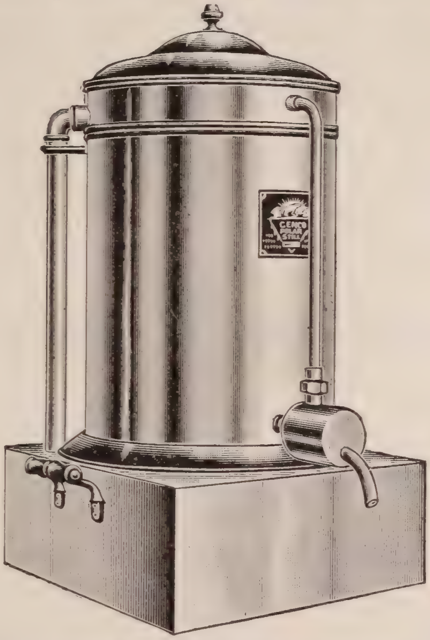

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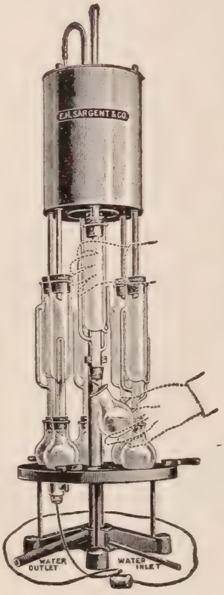

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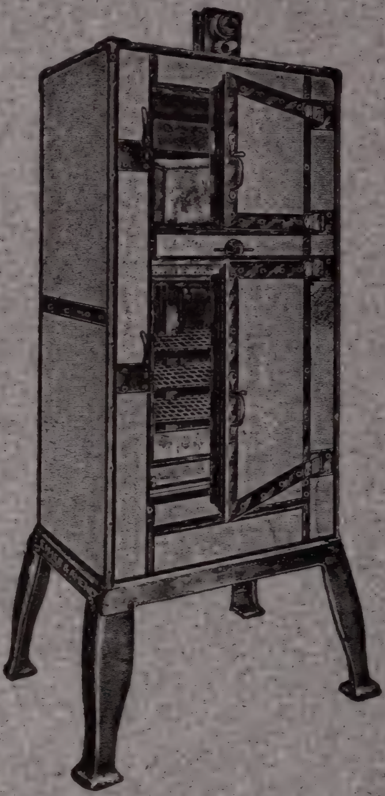

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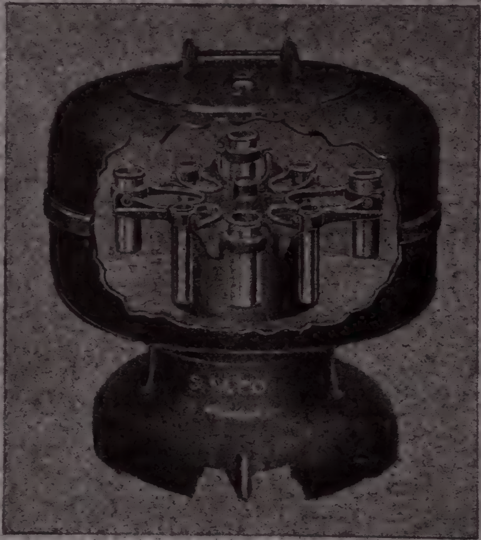

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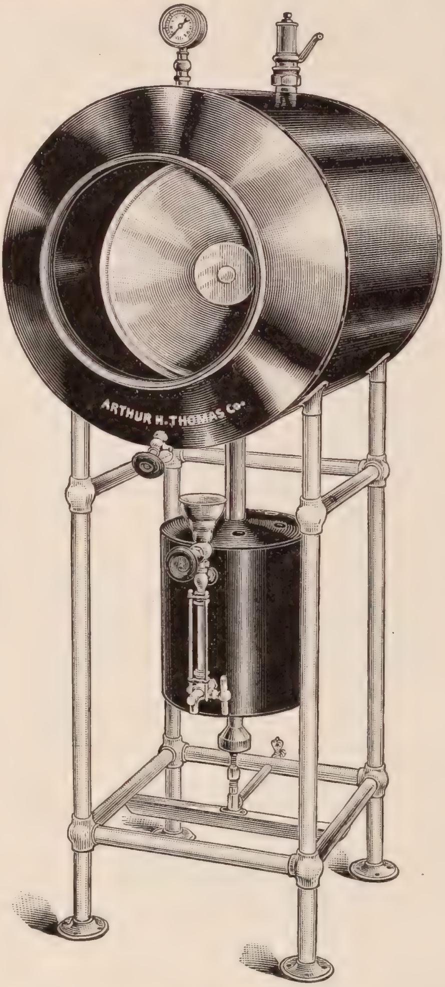
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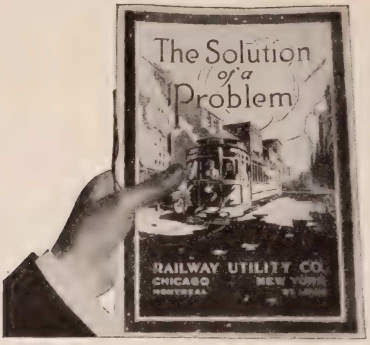

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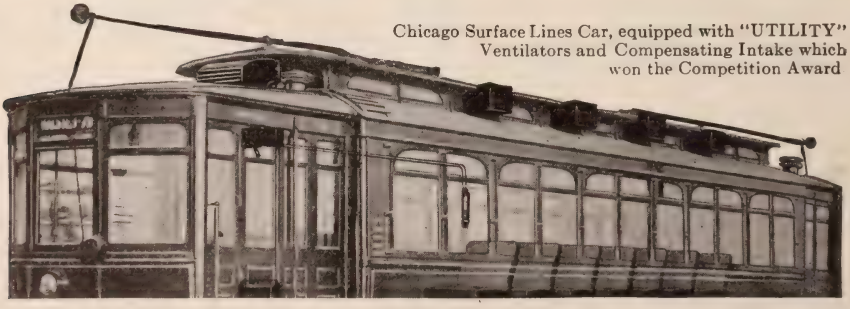

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The young physician smiled. "The probabilities are," he replied, "that the counsel for the defense would."—*Boston Transcript.*

*

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"Of course."

"Nothing would wake him?"

"Nothing. But—"

"Wait a bit; you could break his jaw or black his eye without him feeling it?"

"My dear sir, of course, I—"

"It lasts about half a minute, doesn't it?"

"Yes."

With a wild whoop of joy and relief the excited man threw off his coat and waist-coat.

"Now," he yelled, as he tugged at his shirt, "get yer gas-engine ready. I want you to pull a porous-plaster off my back."—*Tit-Bits.*

*

Universal Health Insurance for workingmen would do two things, which need to be done in this country, if we are going to save democracy. One is to improve public health, because just as compulsory workingmen's insurance against accidents has led to the safety-first movement and thrown safeguards around machinery, which we never had before, so health insurance will lead to a health first movement, and will enlist the financial motive of the employer as well of the employee and of the state, to save human life. It will also go far to prevent poverty, not only because of making workingmen healthier and therefore increasing their earning power, but also because of preventing that descent into poverty, which disease produces. So far as I can discover, the most important single cause of poverty is disease.—*Irving Fisher.*

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Good Food on Dirty Dishes.—If cooking is an art, then dishwashing is a science. Unfortunately, many of our restaurants practise neither art nor science, even though most people are willing to sacrifice a small degree of art for the benefit of science. It is not stimulating to one's aesthetic senses to see dirty dishes hurriedly dipped into greasy dishwater and used for serving food, without proper scalding or drying, nor is it good practice from the public health standpoint. Furthermore, the best of food may be wasted if served on dirty dishes. It would seem that many restaurants must be under constant supervision as a reminder that good dishwashing is of equal importance with good cooking.—*Bulletin, California State Board of Health.*

* * *

Same Treatment.—"Doctor, my husband is troubled with a buzzing noise in his ears."

"Better have him go to the seashore for a month."

"But he can't get away."

"Then you go."—*Boston Transcript.*

* * *

Sanitary and Moral Problems cannot be solved by building hospitals, prisons and reformatories. Such institutions are in a great degree monuments to our ignorance. The number of delinquents and dependents in any state are in direct ratio to the number of defectives; and it is within the power of man to eliminate defectives. —*Exchange.*

* * *

The Highest and noblest form of charity is the *prevention* of poverty and immorality. Relief and amelioration are necessary because prevention is not practiced. Let us reorganize most of our charity and relief societies into prevention societies. The relief and amelioration we give is a measure of our failure to utilize heredity and eugenics.—*Exchange.*

* * *

A Labor Problem.—Two Irishmen died and (because of the lives they led) one went to heaven and the other in the opposite direction. About three hours after their departure, Mike, worried as to the condition his friend might be in, called down:

"What are ye doing, Pat?"

"I'm shovelin' coal."

"Do ye wurruk hard?"

"Not very. We have shifts. I wurruk only about three hours every day. What are ye doin'?"

"Faith an' I'm sweepin' off the golden stairs."

"Do ye wurruk hard?"

"Yis, very hard. About eighteen hours a day. We're very short-handed here."—*Jour. A. M. A.*

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While, pipe in mouth, I strolled about at ease;
A pretty daughter kept me company
And saw my house was as it ought to be—
My practice I had handed down to my son;
I said to myself, "My toiling days are done,
Make way for youth!" I whispered to myself,
And comfortably curled up on my shelf.
"Let others work. Their turn it is," said I;
"For me, I shall be lazy till I die."
Now, I rise early and sit up late,
I drive the car myself—a thing I hate!—
Interminable rounds. My son is gone,
Also his neighbor; and I scramble on,
Hot, weary, cross. Hear half and guess the rest,
"Behind the times—the old man's past his best.
I wish the son were back!"—Heavens, if they knew
How heartily all my bones desire it, too.
Reproachful Panel patients, stern and tense,
Sit waiting for the drugs I must dispense.

I wish my old cook's thoughts some line would take
Away from the alternate chop and steak.
I wish the babies sometimes would arrive
At other hours than midnight up to five.
I wish my girl were somewhere near at hand,
If she must dig in someone else's land.
I wish my heart were sounder—for I fear
I'll scarcely stick it out another year.
I wish that I might live to see my son.
I wish—God, how I wish the war was done!

Incessant as a clock goes round my brain;
I dream at night of clutching brakes in vain
While running into crowds. I cannot eat.
My eyelids feel as leaden as my feet.
It would be Heaven to sleep the whole clock round,
To sleep till one was rested; and sleep sound.

And yet—all poorly as I do my part,
I thank God nightly He has let my heart
Stand one day's strain more; and I thank Him, too,
There's still some work that I am fit to do;
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—Dinadan, in the *Westminster Gazette*.
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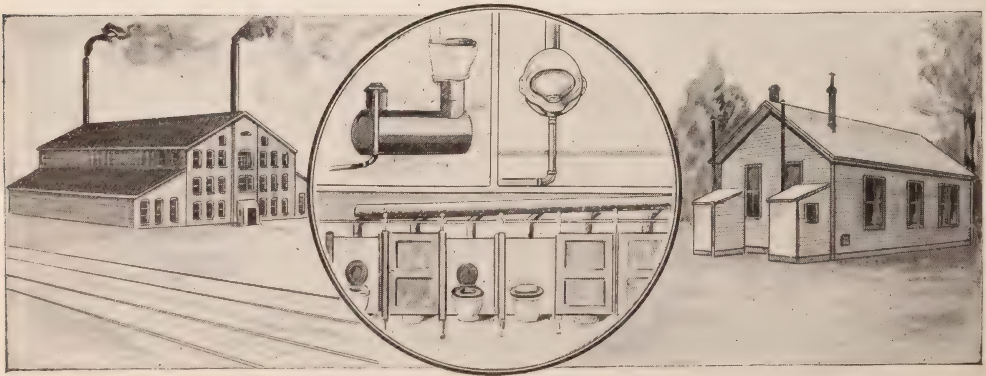

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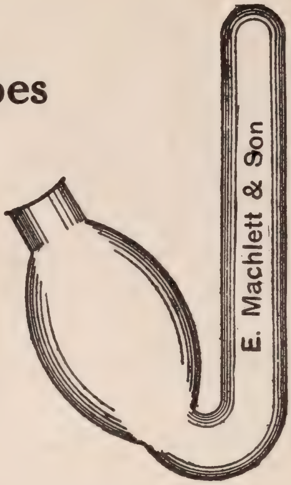

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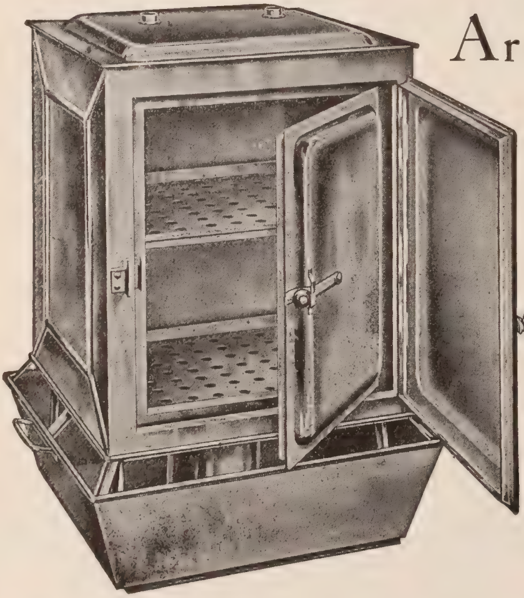

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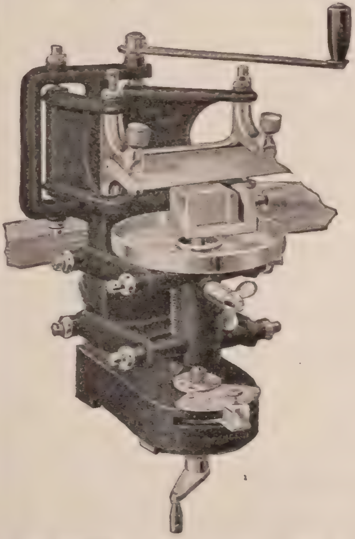

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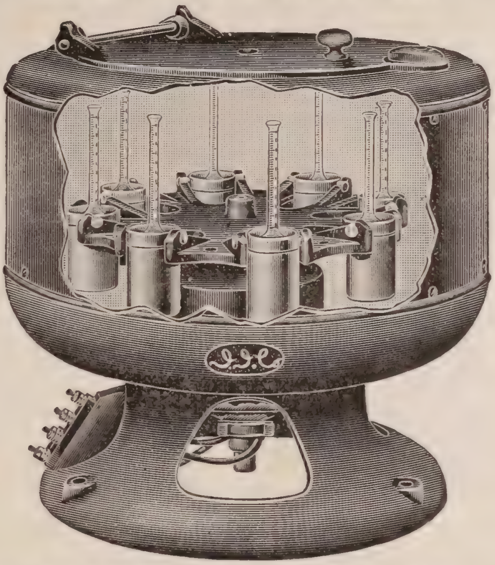

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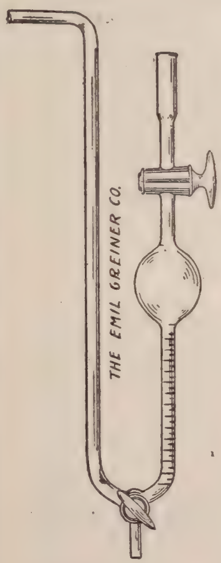
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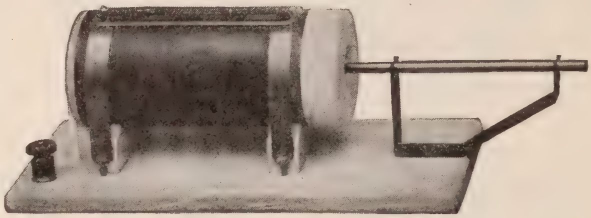

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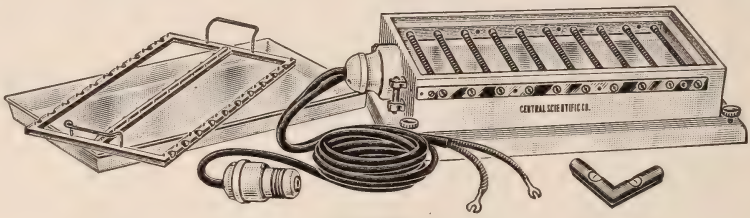
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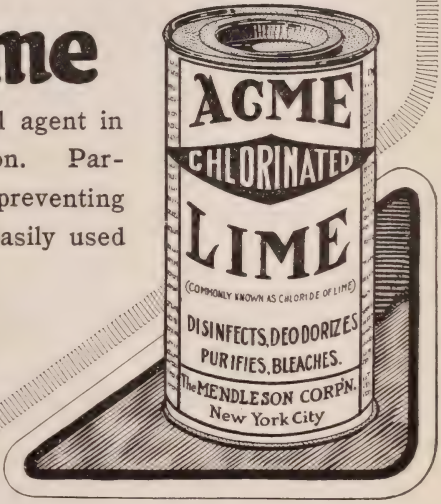

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*United States Public Health Bulletin No. 69, May, 1915.

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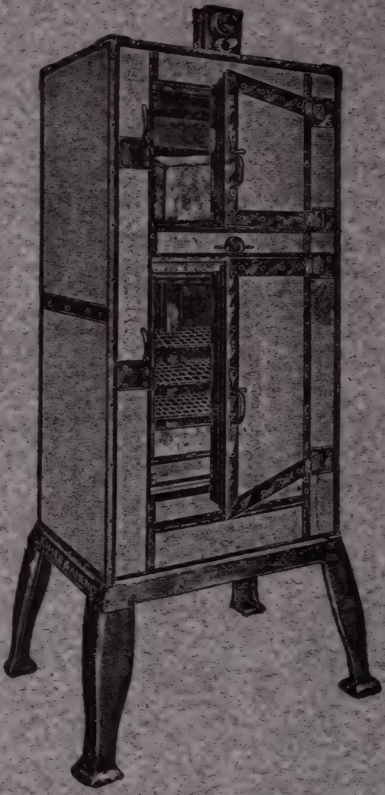

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AMERICAN JOURNAL OF PUBLIC HEALTH

THE JOURNAL OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

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AMERICAN PUBLIC HEALTH ASSOCIATION ANNUAL MEETING,
CHICAGO, ILLINOIS, OCTOBER 14-17, 1918

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American Journal of Public Health

Official Monthly Publication of the American Public Health Association
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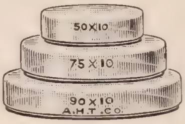

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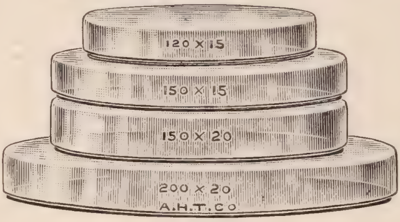

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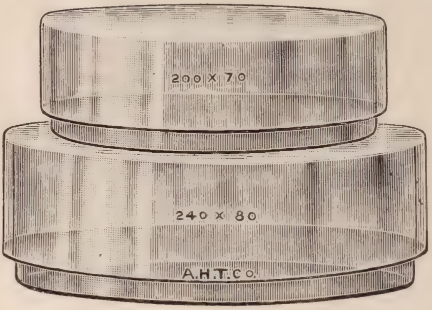

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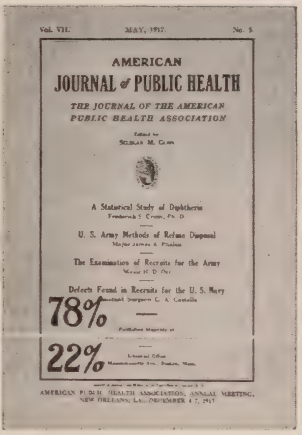

Vol. VII. MAY, 1917. No. 5.

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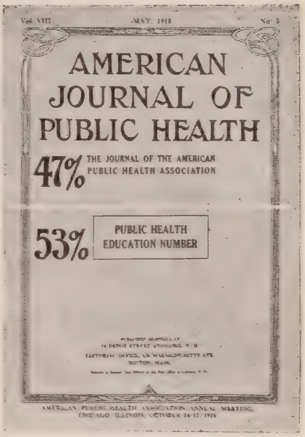

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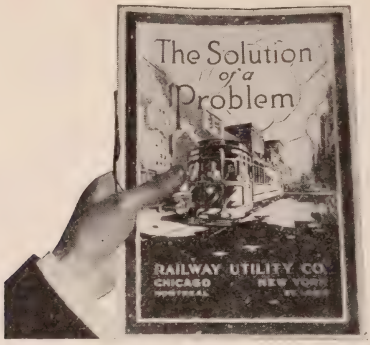

It not only describes the best method of ventilation, but also the most efficient way to heat street cars.

It is a booklet that Public Health Officials will find of value in helping them solve their traction problems.

It also shows how tremendous savings can be effected in electrical energy, and

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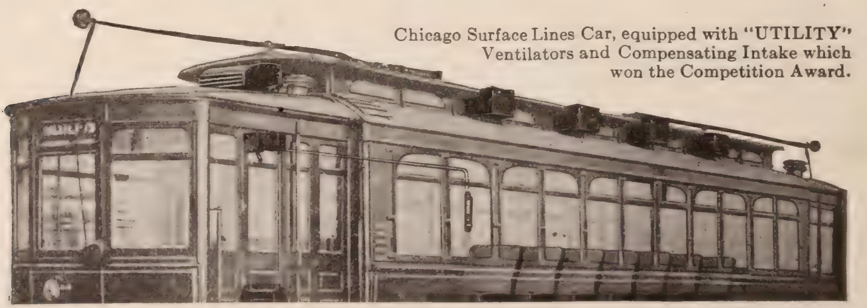

Chicago Surface Lines Car, equipped with "UTILITY" Ventilators and Compensating Intake which won the Competition Award.

Public Health Clippings.

Prepared by David Greenberg.

The Wrong Process.—A colored Baptist was exhorting.

"Now, breddern and sistern, come up to de altar and have yo' sins washed away."

All came up but one man.

"Why, Brudder Jones, don't yo' want yo' sins washed away?"

"I done had my sins washed away."

"Yo' has? Where yo' had yo' sins washed away?"

"Ober at de Methodist church."

"Ah, Brudder Jones, yo' ain't been washed; yo' jes' been dry cleaned."—*Life.*

*

Mary's Little Cold.—

Mary had a little cold,
It started in her head.
And everywhere that Mary went
That cold was sure to spread.

It followed her to school one day,
There wasn't any rule.
It made the children cough and sneeze
To have that cold in school.

The teacher tried to drive it out,
She tried hard, but—kerchoo-oo!
It didn't do a bit of good
For teacher caught it too.
—Lyda Allen DeVilbiss.

*

Too Long a Time.—Sir William Osler, the famous English doctor, who has just gone to the front with the McGill university base hospital, tells the following amusing story to prove the importance of medical men being very explicit in their directions to their patients:

A young foreigner who consulted a doctor about his health was advised by the medico "to drink hot water an hour before breakfast every morning."

The patient went away promising to do as he was told, but a few days later he returned and complained that he felt much worse.

"That's curious!" said the doctor, "did you do as I told you and drink that water an hour before breakfast every morning?"

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Clean your teeth and then
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Omit lunch to reduce weight and then
Overeat at dinner?

Go to the country for health and then
Sleep with your windows shut tight?

Wonder why you have earache and then
Blow your nose with your mouth shut?

*

Smith had a bouncing baby boy,
You should have heard him beller;
I could not tell you all Smith called
That squalling little feller.
—*Santa Fe New Mexican.*

*

A Hero in Blue Overalls.

Listen, my children, and you shall hear
Of a patriot's work in this present year.
He didn't ride through the roads at night
To rouse the neighbors to arm and fight,
But he went to work with a spade and hoe
And he made ten bushels of 'taters grow.

He mopped the sweat from off his brow
As he trudged behind his handpower plow;
His hands grew tough and his feet got sore
As he turned the stubborn furrows o'er,
And his neighbors laughed as they called him slow,
But he made ten bushels of 'taters grow.

Oh, cheer the boy with the sword and gun,
Who has fought and bled, when the war is done,
And cheer the generals and majors, too,
And the sailor bold on the ocean blue;
But cheer the man and his spade and hoe
For he made ten bushels of 'taters grow.
—Edgar A. Guest.—*Louisiana Monthly Bulletin.*

*

Tommy had the measles,
A piteous sight was he;
So Jack and Susie went around
To keep him company.

Alas for Jack and Susie!
They caught the measles, too,
Lost days from school,—how sad they were
When "passing" time was due!
—*Louisiana Monthly Bulletin.*

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Courses designed for the training of men and women for public health careers were first offered by the University of Pennsylvania in 1906, and classes have been graduated each year since 1909-10.

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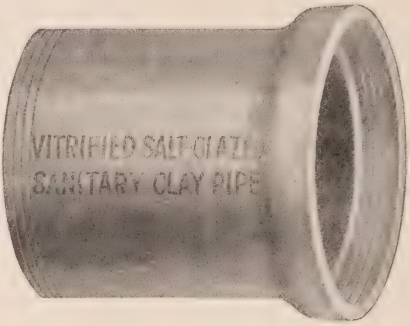

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CHICAGO, ILLINOIS

Mary Again.

Mary had a cold one day,
  It started in her head:
And everywhere that Mary went
  That cold was sure to spread.

It went with her to school one day;
  It seldom is the rule
For happy children, bright and gay
  To fear a cold at school.

So the teacher came up close
  Took Mary on her knees
Right then and there she got her dose,
  And soon began to sneeze.

So hawk and sneeze became the rule
  In that fair country side,
The doctor made his many tens,
  And new-born babies died.

Never, never, blame the Lord:
  But learn this simple rule,
To keep your "bad colds" to yourself
  And cease to act the "fool."

—*North Carolina Press Article.*

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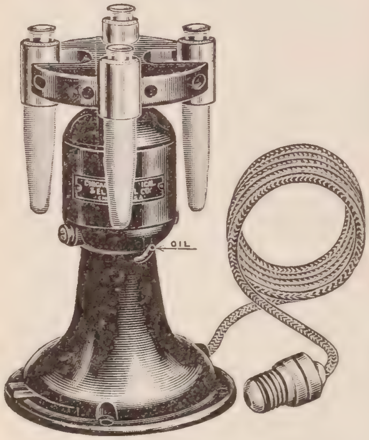

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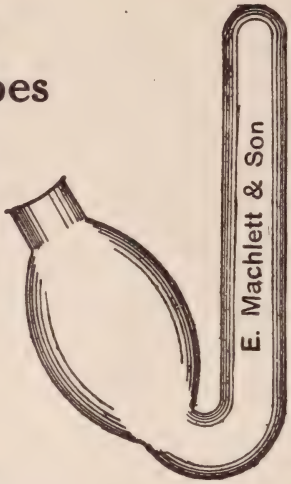

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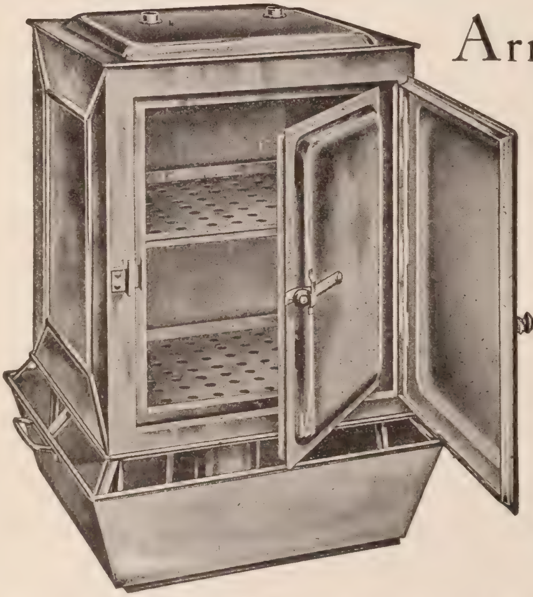

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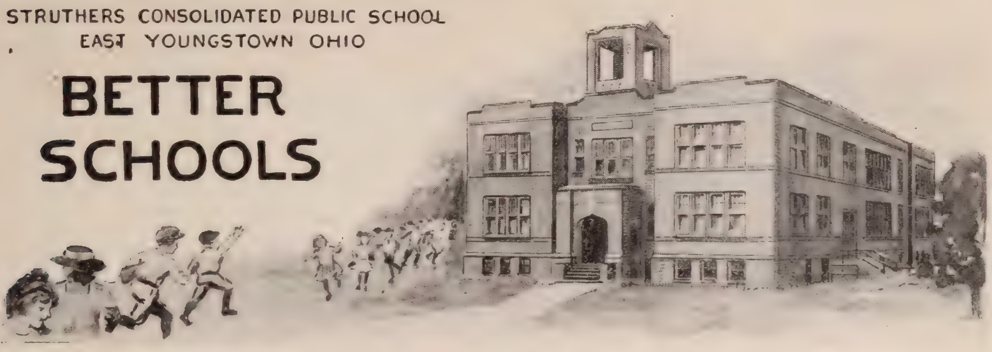

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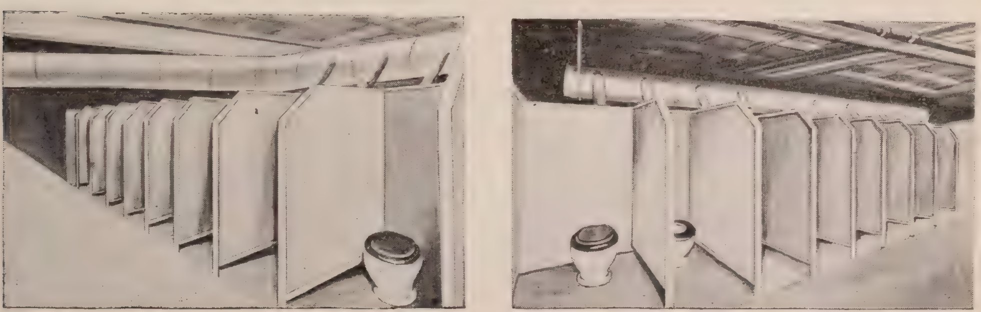

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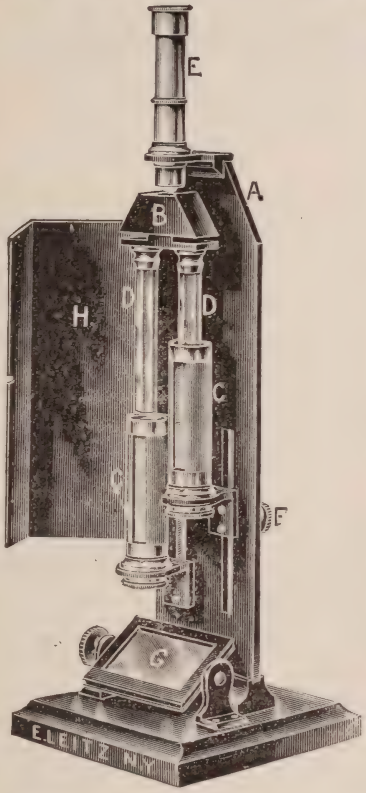

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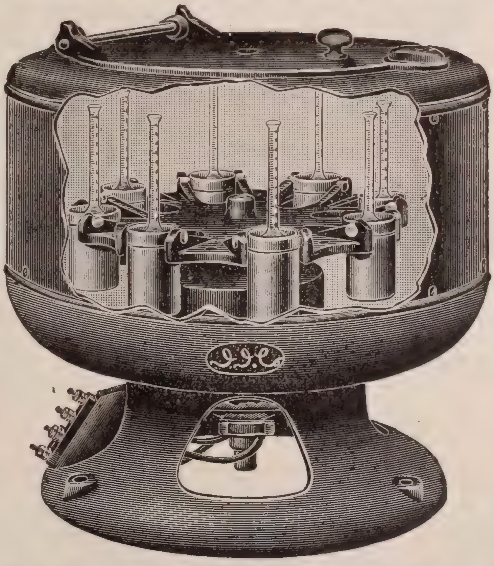

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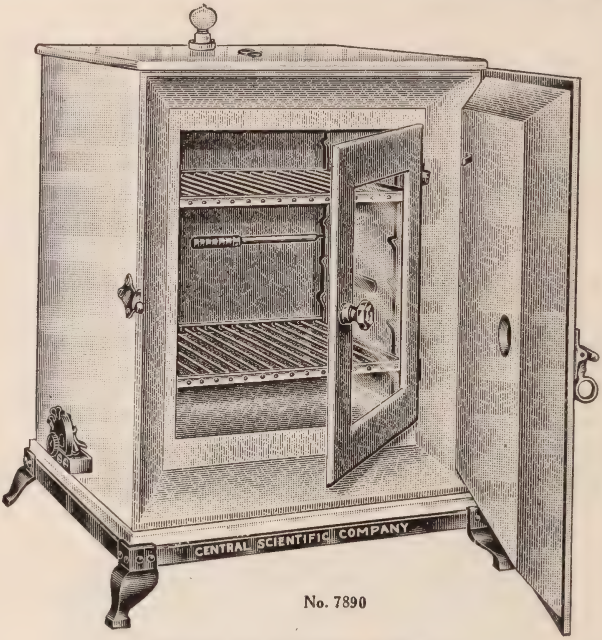

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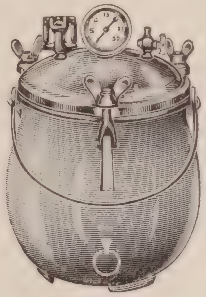

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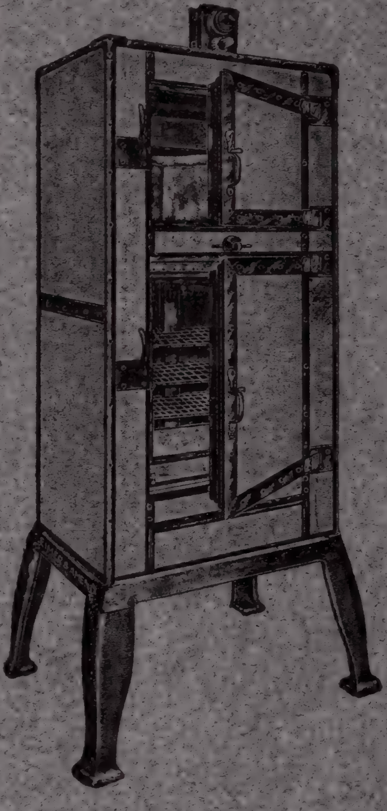

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AMERICAN JOURNAL OF PUBLIC HEALTH

THE JOURNAL OF THE AMERICAN
PUBLIC HEALTH ASSOCIATION

THIS ISSUE CONTAINS ON PAGE 623 THE

PRELIMINARY PROGRAM

OF THE

ANNUAL MEETING

October 14-17, 1918
Chicago, Illinois

PUBLISHED MONTHLY AT
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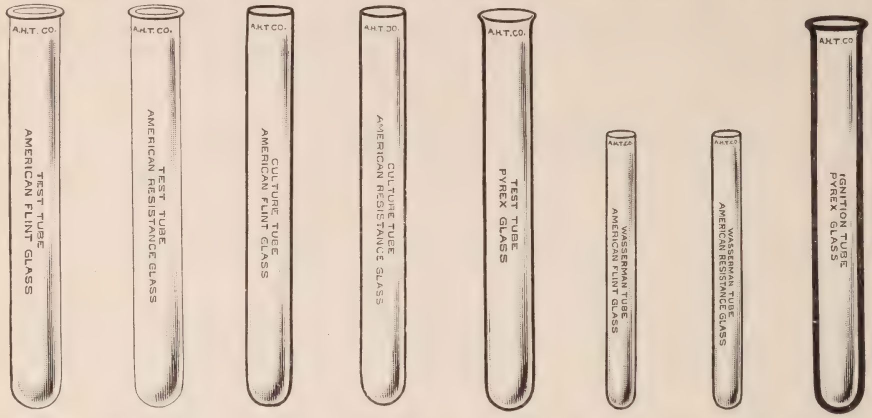

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Public Health Clippings.

Prepared by David Greenberg.

Ode to the Ankylostoma Duodenale.

By J. Liftchild, M.D., Shawmut, Cal.

Lo, the poor Hookworm! whose untutored mind
Intestinal canals essays to find;
Of whose evolvings savants show the mode,
From egg to larva, then to nematode.
Its soul proud science never sought to stray
Far as the solar walk, in slime it lay;
Trusting that fate would soon the favor grant
To reach the genus homo's sewage plant.
Once through a pore or down the fauces passed,
Its homing instinct finds the goal, at last;
And staking out a claim inside the lumen
Of ileum or convolate jejunum,
It yields to Cupid's dart, seeks out its mate,
And joyfully proceeds to propagate.
There, safely clinging to sustaining villi,
It feasts and fattens, hoping willy-nilly,
That no dread oil of chenopodium,
Whose presence fills its breast with odium,
Will be ingested by its long-suffering host
And straightway force him to give up the ghost;
And later, fixed to microscopic slide,
Be rubbered at in posture as he died.

—*Monthly Bulletin, California State Board of Health.*

*

Mrs. Murphy—"Sure, it was tin stitches they had to be takin' in me Mike whin he come out of that accident."

Mrs. O'Whoolihan—"Tin? Only tin? Faith, an' whin they pulled me Patrick out of that wrick on the railroad last June the doctor did be sayin': 'An is there a sewin' machine handy?' "—*Oral Hygiene.*

*

If the fighting force of our army "over there" is to be maintained—the health of our civilian population "over here" must be looked after.

*

Two Chances Left.

Cheer up! You have two chances: one of being drafted and one of not.

And if you are drafted, you have two chances: one of going to France and one of not going.

And if you go to France, you have two chances: One of being shot and one of not.

And if you are shot, you have two chances: One of dying and one of not dying.

And if you die—Well! You still have two chances!

—*Monthly Bulletin, Kansas State Board of Health.*

BACON SAID:

"Some books are to be tasted, others are to be swallowed, and some to be chewed and digested; that is, some books are to be read only in parts; others to be read but not curiously; and some few to be read wholly, and with diligence and attention."

So it is with advertisements. Some you will merely glance at in passing; others you read casually; still others are to be carefully examined.

You can no more afford to ignore advertisements than books and scientific journals.

Look over the advertisements in this issue in the light of Bacon's counsel and ask whether it wasn't worth while.

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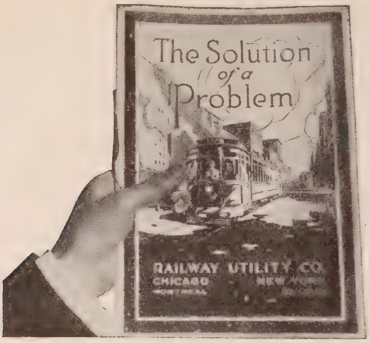

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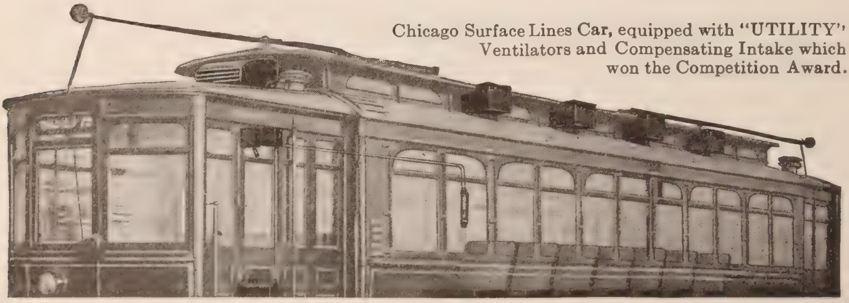

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Disease germs haven't wings.

* * *

They don't fly through the air like goblins and evil spirits.

* * *

Disease germs haven't legs like a kangaroo.

* * *

They can't jump from the sick to the well.

* * *

Nearly all contagion is due to some kind of contact—direct or indirect.

* * *

Most contagion may be prevented by the absolute destruction of the body secretions of the sick—sputum, urine, feces and sweat—and the absolute disinfection of all articles contaminated by these things.

* * *

Bedside disinfection is a very exact thing. Like "surgical cleanliness"—if thorough it is absolutely effective,—if careless, it leads to calamity.

* * *

The successful disinfector always keeps in mind what he is trying to accomplish. Many disinfectors "go through the motions" of disinfecting thinking of the method and not of the purpose. Disinfecting isn't a game and it isn't play acting. It is a real, serious job that has a reason.

* * *

When disease spreads, someone has bungled.

* * *

When a nurse, caring for a contagious disease patient, becomes infected, some one is to blame; —either the nurse or the people who trained her. —*Illinois Health Bulletin.*

◆

The Third Great Plague.

"Syphilis is still shrouded in obscurity, entrenched behind a barrier of silence, and armed by our own ignorance and false shame, with a thousand times its actual power to destroy."

—*Stokes.*

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—*Washington Star.*

⁂

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The clerk begged her to hold the 'phone a moment. Then he went away and gnawed a corner of his desk. When he returned to the 'phone he said: "I've just been looking up the books, Madam, and I'm happy to say that we have not received a complaint from a single one of our cows."—*Oral Hygiene.*

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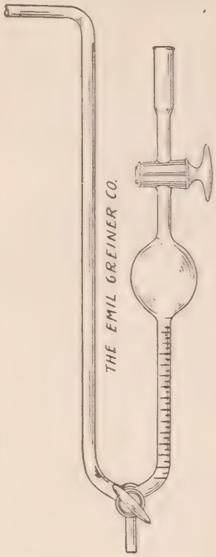

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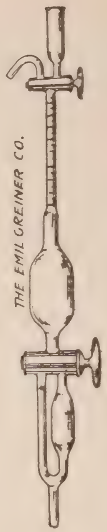

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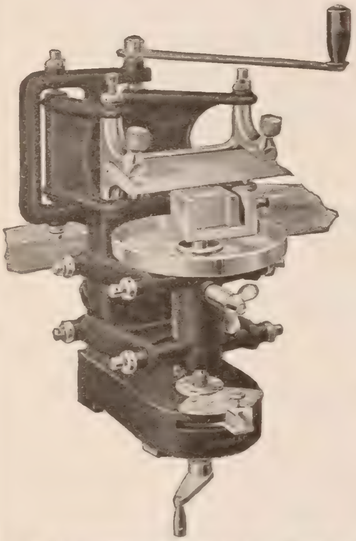

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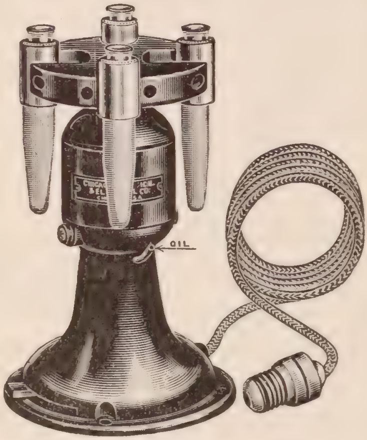

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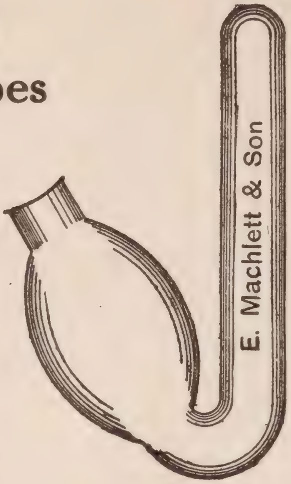

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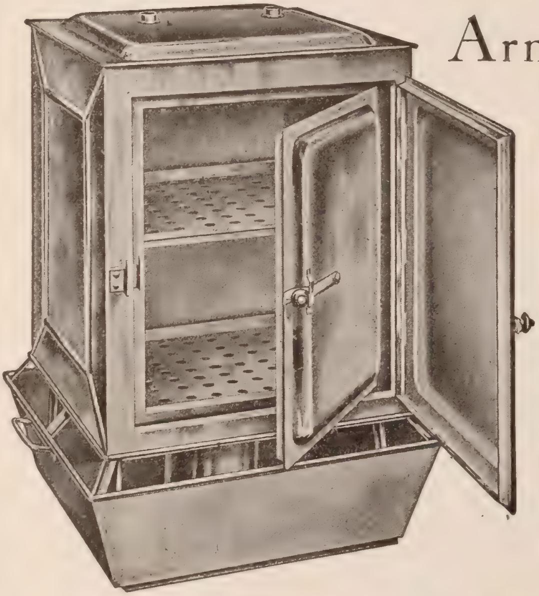

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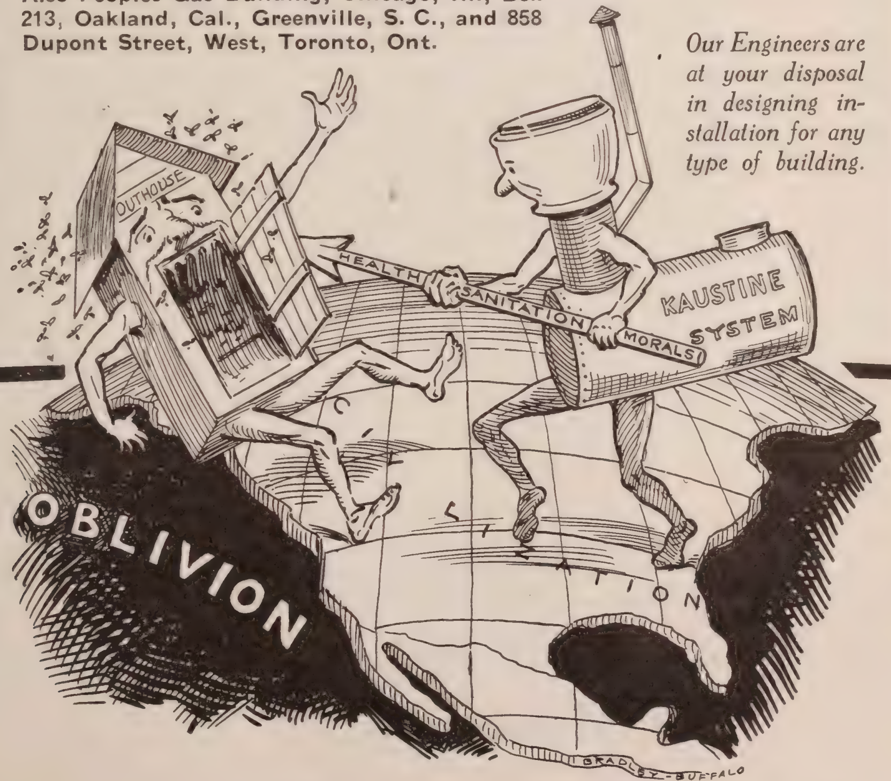

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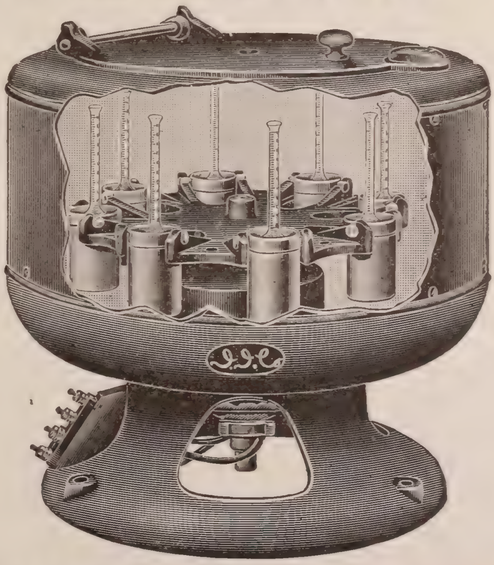

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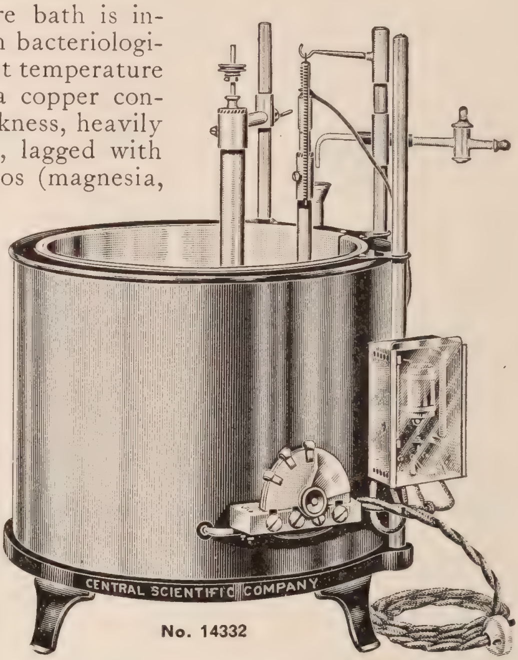

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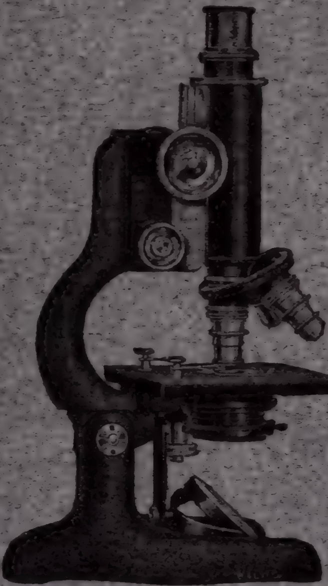

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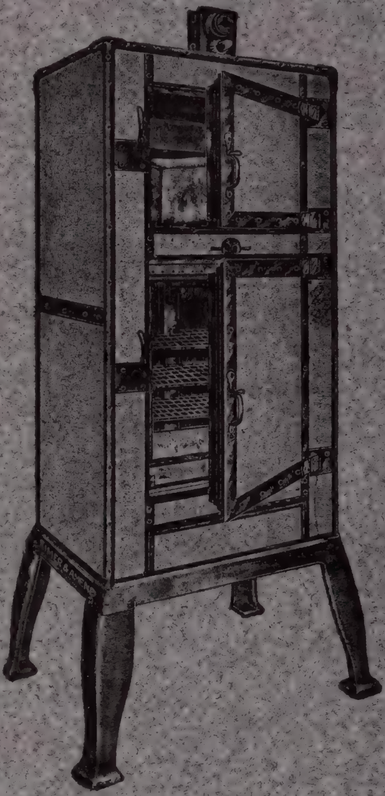

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AMERICAN JOURNAL OF PUBLIC HEALTH

THE JOURNAL OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

THIS ISSUE CONTAINS ON PAGE 704 THE

PRELIMINARY PROGRAM

OF THE

ANNUAL MEETING

TO BE HELD
October 14-17, 1918
Chicago, Illinois

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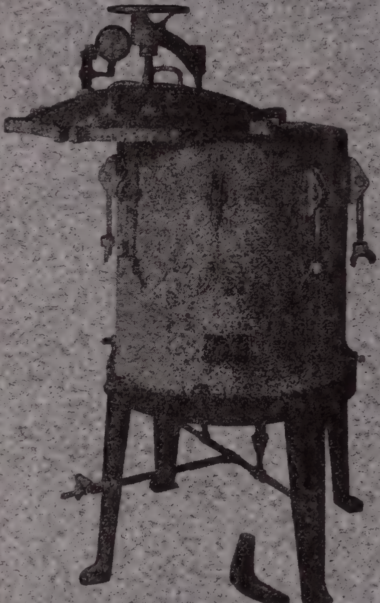

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Think of It!

A director of the American Public Health Association wrote me last week: "A letter to our members to increase annual meeting attendance wouldn't bring back its postage." Think of it!

Let's show him how badly mistaken he is about loyalty. Fill out, tear off, and send this slip to:

- -

Secretary, American Public Health Association,
126 Massachusetts Ave., Boston, Mass.

I nominate for membership
I will invite to the Annual Meeting
I want you to invite to the Annual Meeting } (Please specify which)

Name..

Address..

.... (Date)

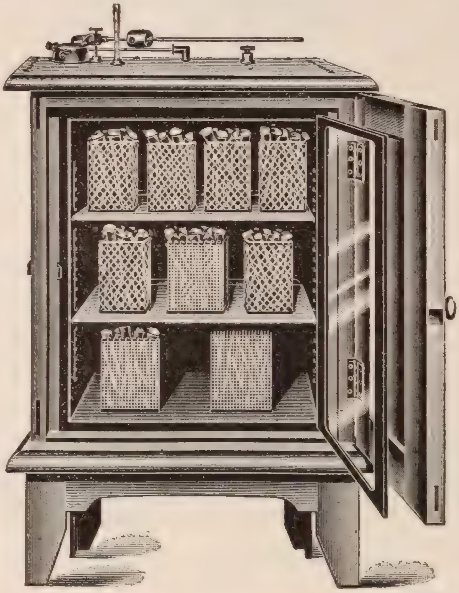
.... (Signed)

.... (Please write your address)

HEARSON INCUBATORS

WITH HEARSON PATENT CAPSULE TEMPERATURE CONTROL FOR GAS, OIL AND ELECTRIC HEATING

A large stock has just been received, all of which is available for immediate shipment



No. 20740 Hearson Gas Heating Incubator, with inside dimensions 15x15x18 inches. Price $120.60

We have supplied several hundred Hearson Incubators to important U. S., State, City and Hospital bacteriological laboratories throughout the U. S. Their performance has been universally satisfactory, and in view of this experience we are willing to recommend the Hearson patent capsule temperature control as being the most accurate and simple device for the uniform control of incubator temperature now on the market.

We supply them in nine sizes for gas heating, six sizes for oil heating, six sizes for electric heating and eight sizes for low temperatures, and keep a stock on hand of the more popular sizes for immediate delivery.

Complete descriptive pamphlet sent upon request

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WEST WASHINGTON SQUARE PHILADELPHIA, U. S. A.

Public Health Clippings.

Prepared by David Greenberg.

The Fate of Four Flies.—Dr. Harvey W. Wiley, of pure food fame, is responsible for the following:

"Four flies, which had forced their entrance into a certain pantry, were bent upon having a feast. One flew to the flour and ate heartily; but soon died, for the flour was loaded with plaster of Paris. The second perched himself on the sugar can; but he fared no better, for the sugar was full of white lead. The third decided to sample the sirup, which stood temptingly near; but his legs were shortly raised toward the ceiling, for the sirup was colored with anilin dyes. The fourth and only surviving one had been coquettishly hovering around the different receptacles, apparently unable to choose. But finally, overcome with grief at the death of all his friends he also decided to end his life and drank deeply of the fly-poison which he found in a convenient dish. But he is still alive, and in excellent health. The fly-poison, too, was adulterated.—*Your Health* (Cleveland).

*

The Hog's Day.—A conference between the board of health, Mayor Sullivan, the city marshal, Dr. Mary R. Lakeman and Dr. Lyman A. Jones of the state board of health, was held Wednesday. The purpose of the conference was to form methods and to seek the co-operation of the medical fraternity in carrying out the provisions of the state law in regard to the reporting of venereal disease cases. Some few swine and stable permits were granted.—*Salem (Mass.) News.*

*

Why They Merely Nod.—Young Mother: "The doctor says people shouldn't kiss the baby; it isn't sanitary."

Caller: "Poor little fellow; why don't you wash him?"

*

Officer: "How did he get into that condition?"

Private: "He captured a bottle of whiskey, sir."

Officer: "Yes, yes; how but did he manage to do that?"

Private: "I think he must 'ave surrounded it, sir." —*Texas Medical Journal.*

YOU DO COUNT

It is a common thing for a new advertiser to write to the Journal: "We will try your publication for a few months, and give you a long-term contract if we get results."

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Continue looking over the advertisements each month, and mention the Journal when writing to advertisers.

AMERICAN JOURNAL OF
PUBLIC HEALTH

(Advertising Talk #10)

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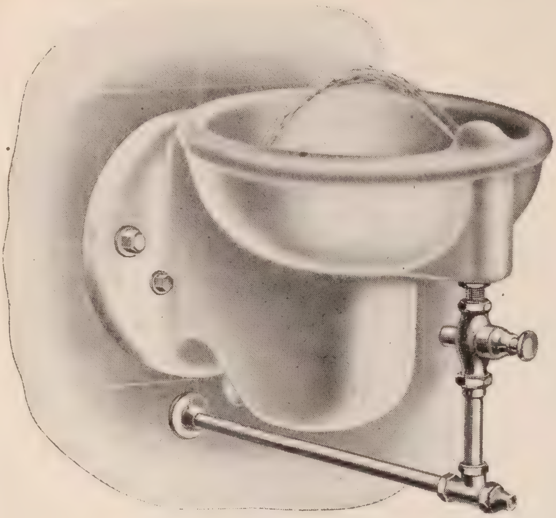

Water is delivered at an angle. It can not fall back and contaminate the nozzle.

The researches of Pettibone, Bogart, Clark, and Whittaker have shown that the slanting, protected jet is essential to safety. This is used on the **DOUGLAS PUBLIC DRINKING FOUNTAIN.**

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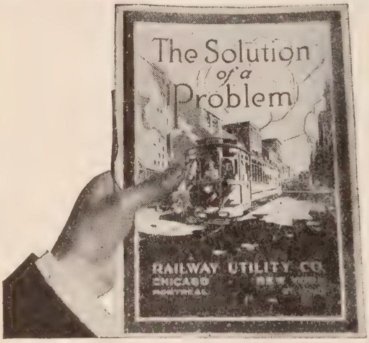
John Douglas Co.
Cincinnati, Ohio



Public Health Officials

will find in this booklet much of value to aid them in solving car ventilating and heating problems.

The matter of fuel saving is now of vital import. The above booklet shows how one electric railway is saving thousands of tons of coal annually. Write for a copy.

RAILWAY UTILITY COMPANY

Mfrs. of Ventilators and Thermostatic Heat Regulators for street cars

151 W 22nd STREET **CHICAGO**

There has been a remarkably clear demonstration of the fact that intelligently directed public opinion can be counted upon to safeguard public interest when the issue is indeed a vital one; that public health education has proved to be a most essential factor in municipal health progress; and that the people are at last beginning to realize the need for trained experts in government.

It is well, however, for the citizens of New York, and citizens of other large cities as well, to recognize the fact that municipal health service must be developed along somewhat broader lines in the future. Almost every large American city has gone beyond the imagination of the early framers of its health policy, and health organizations will need to be adjusted from time to time to meet in a more direct and less impersonal manner, community ideals and interests. Controversies such as this (Investigation of New York City Health Department) are likely to recur with each succeeding administration, and as in the present case the real issues will likely be obscured by the dust of personal and political squabbles.—*C. E. McCombs, Public Health and Private Investigations.*

*

The Environment of the infant is its mother; its health and physical fitness are dependent primarily upon her health, her capacity in domesticity, and her knowledge of infant care and management.—*Report of Medical Officer to the Board of Education*, 1914.

It Is Clearly the Duty of husbands and fathers to arrange that their wives and children receive more adequate and better medical nursing, and domestic assistance than is now secured, and to insist upon obtaining and being willing to pay the rental of better houses. All this will cost money. But sickness costs more money; the industrial and social efficiency of adults resulting from illness in childhood costs still more money. Health, when we have paid for it, is always cheaper than disease; and within limits we can have as much health as we are prepared to pay for.—*Arthur Newsholme.*

*

Only to Purify the Blood.—"Hab yo' any medicine dat will purify the blood?"

"Yes," answered the druggist. "We keep sarsaparilla, at one dollar a bottle. It purifies the blood and clears the complexion."

"Well, boss, hasn't yo' sumfin fo' about 50 cents, jess fo' the blood? I don't keer about de complexion."

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Their square form permits easy handling, economy in refrigeration and wagon space.

Made of pure spruce wood fibre; containers immersed (submerged) in hot refined paraffine wax. Thus the entire surface, inside and outside, all edges and corners are completely covered with neutral, impervious paraffine wax.

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The Weis Fibre Container Corporation
265 W. Front St. Monroe, Michigan

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Has Never Before Been Advertised

VITRIFIED Salt-Glazed Sanitary Sewer Pipe was never before advertised in the American Journal of Public Health—a great oversight on our part. Engineers know that Vitrified Salt-Glazed Sanitary Clay Sewer Pipe makes the most dependable sewer, but we have never told the doctors or the public health officials about it.

Since you know the value of sanitary glazed porcelain (clay) in the operating room and laboratory, in the bath room and in the kitchen, you will appreciate what Vitrified Salt-Glazed Clay Sewer Pipe means in the sewer.

IT IS SANITARY

There are no "Ifs"

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A Normal Child.—

Johnny Jones has lost a leg,
Fanny's deaf and dumb;
Marie has epileptic fits,
Tom's eyes are on the bum.
Sadie stutters when she talks,
Mabel has T. B.
Morris is a splendid case
Of imbecility.
Billy Brown's a truant
And Harold is a thief;
Teddy's parents gave him dope,
And so he came to grief.
Gwendolin's a millionaire,
Jerald is a fool;
So every one of these darned kids
Goes to a special school.
They've specially nice teachers,
And special things to wear,
And special time to play in,
And a special kind of air.
They've special lunches right in school,
While I—it makes me wild!—
I haven't any specialties,
I'm just a normal child.
—*From the American School Board Journal.*

⁂

In Due Form.—An army officer's wife wrote an army medical officer saying her child was suffering from tonsilitis. She addressed her letter "Dr. Burke." The recipient returned it with the remark that he should be addressed "Brigade Surgeon Lieutenant-Colonel Burke."

Whereupon the lady wrote back:

"Dear Brigade Surgeon Lieutenant-Colonel Burke:—I am sorry about mistake. Yours, May Jones.

"P. S.—Please bring your sword to take out baby's tonsils."—*Selected.*

⁂

A Logical Wish.—On the outskirts of Philadelphia is an admirable stock farm. One day last summer some poor children were permitted to go over this farm, and when their inspection was done, to each of them was given a glass of milk. The milk was excellent.

"Well, boys, how do you like it?" the farmer said, when they had drained their glasses.

"Fine," said one little fellow. Then after a pause, he added, "I wisht our milkman kept a cow."—*Jour. Amer. Med. Assn.*

SCHOOL OF HYGIENE AND PUBLIC HEALTH
OF THE
JOHNS HOPKINS UNIVERSITY

THE establishment of a School of Hygiene and Public Health is announced by the Johns Hopkins University. Instruction will begin with the opening of the academic session, October 1, 1918.

MEN AND WOMEN STUDENTS WILL BE ADMITTED ON THE SAME TERMS

Courses have been arranged leading to the degrees of Bachelor of Science in Hygiene, Doctor of Science in Hygiene and Doctor of Public Health. A circular describing these courses and giving other information will be sent on application to

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The courses offered include public, municipal, industrial and personal hygiene, with clinical study and diagnosis of contagious diseases including tuberculosis; vital statistics, sanitary engineering, building sanitation, meat and milk hygiene, practical hygiene including physical and chemical methods and bacteriology, medical inspection of schools, sanitary legislation, sanitary surveys.

The course of study extends over a full college year and the work is conducted at the Board of Health Building, Herman Kiefer (Municipal Contagious) Hospital and the College Building. All of the facilities of the Detroit Board of Health are at the disposal of the College faculty and the courses given are therefore, of great practical value to the student.

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BACTO-LACTOSE—especially prepared with reference to bacteriological requirements; free from all other sugars, soluble, colorless in solution, low in moisture and ash.

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Each package carries on the label the name of the medium, its complete formula, directions for use, its final reaction on the basis of hot phenolphthalein titration, and also its final pH value at the temperature of incubation when directions are followed.

By dissolving the specified weight of powder in the required quantity of water, a finished culture medium of definite composition is obtained.

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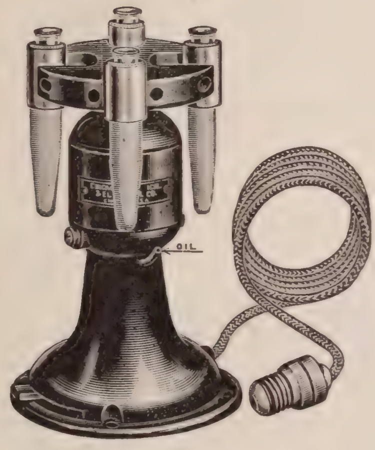

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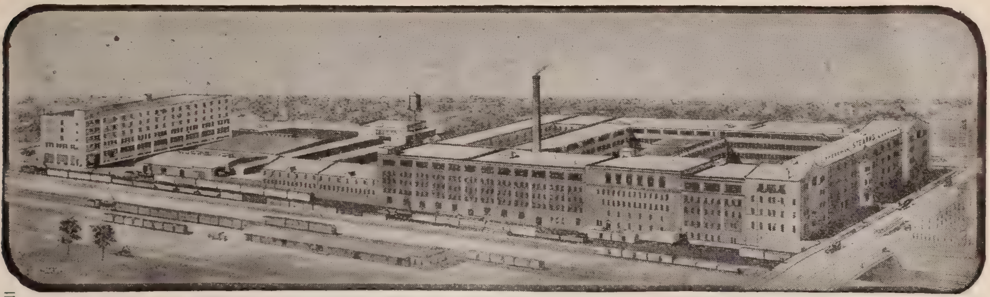

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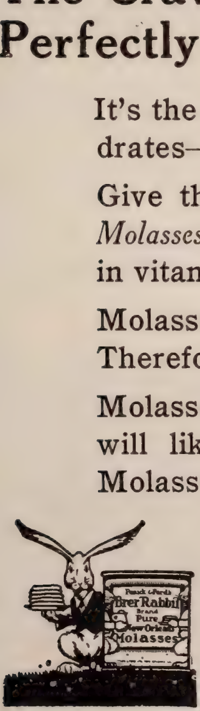

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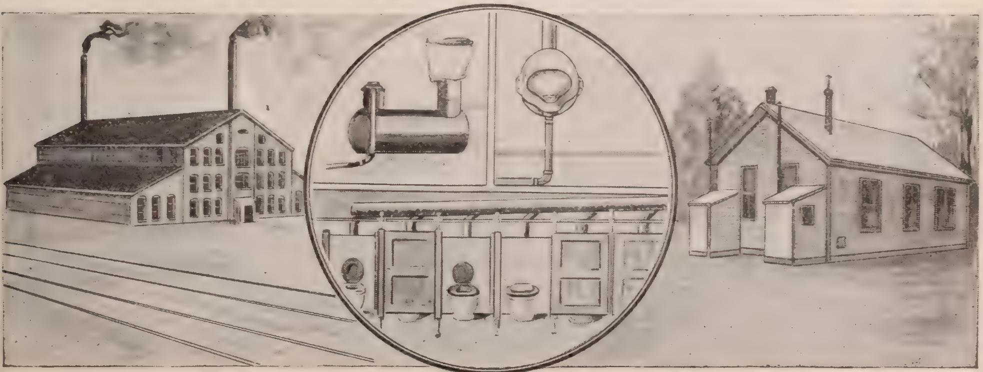

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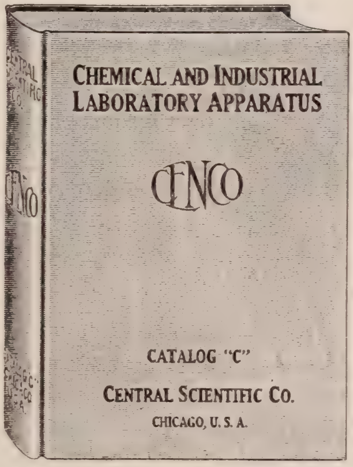

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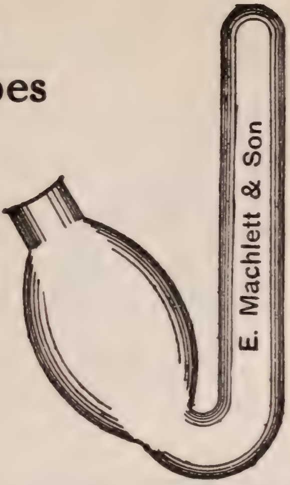

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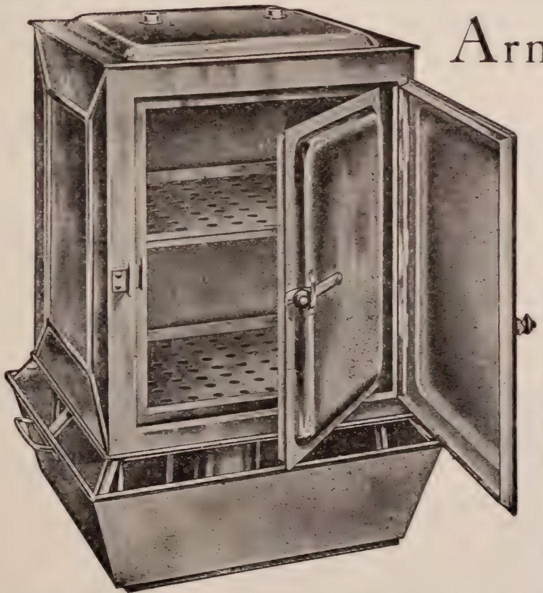

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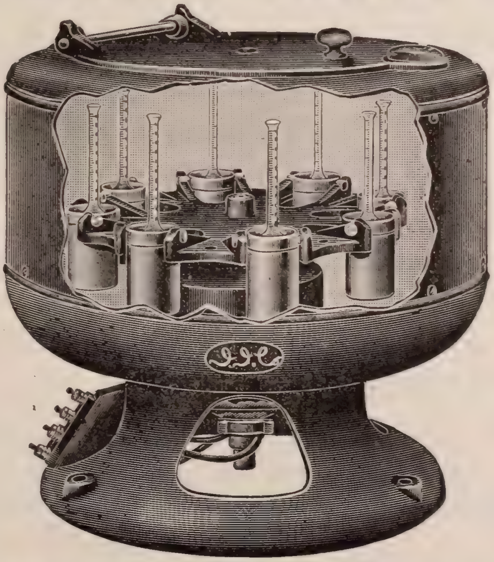

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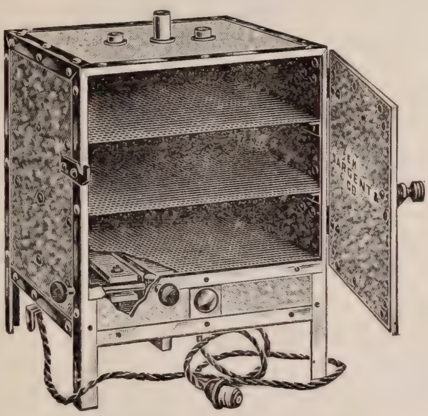
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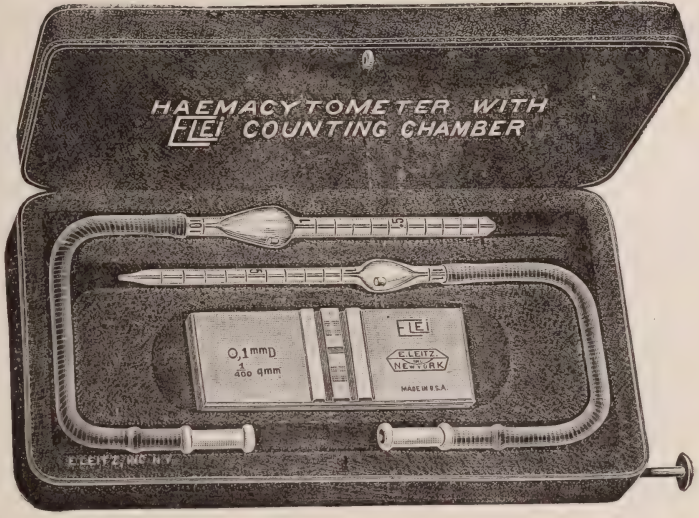

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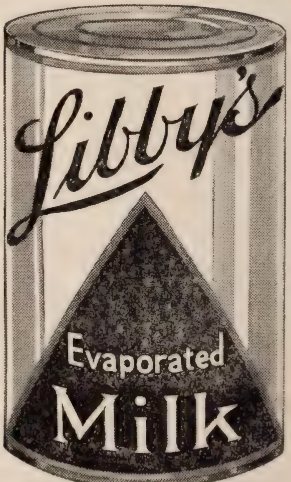

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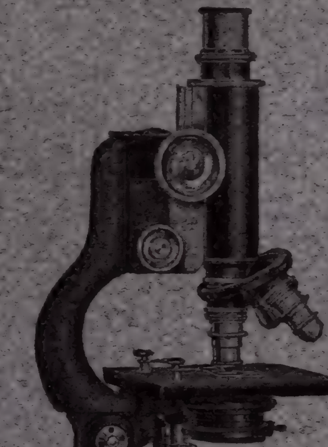

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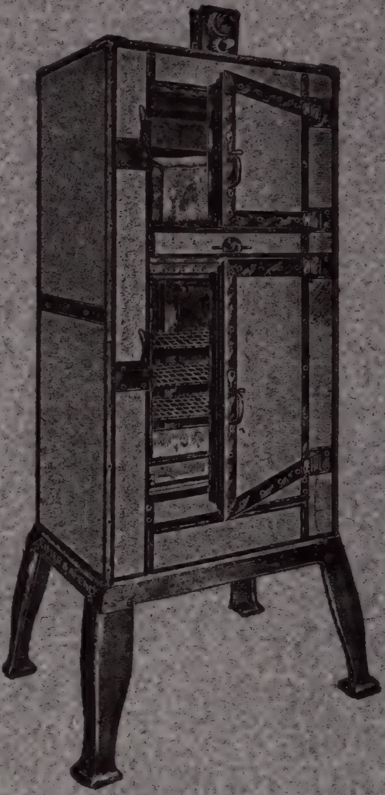

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Surgeon-General William A. Brooks

Centralized Health and Relief Agencies in an Influenza Epidemic
Eugene R. Kelley, M. D., and B. W. Carey, M. D.

The Use of Convalescent Human Serum in Influenza Pneumonia (Preliminary Report)
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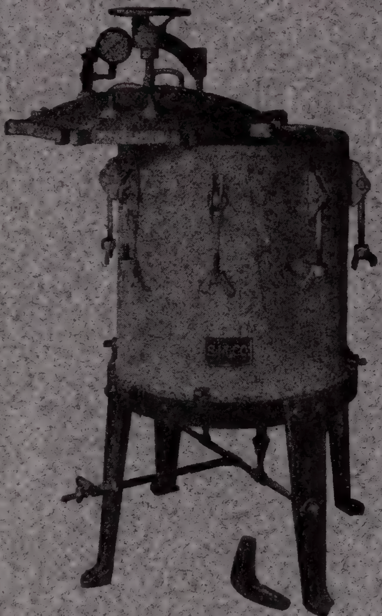

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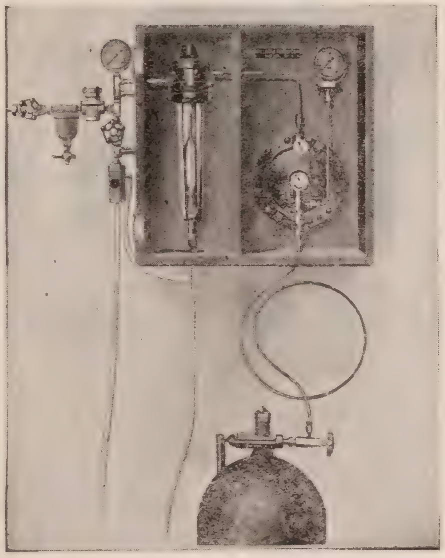

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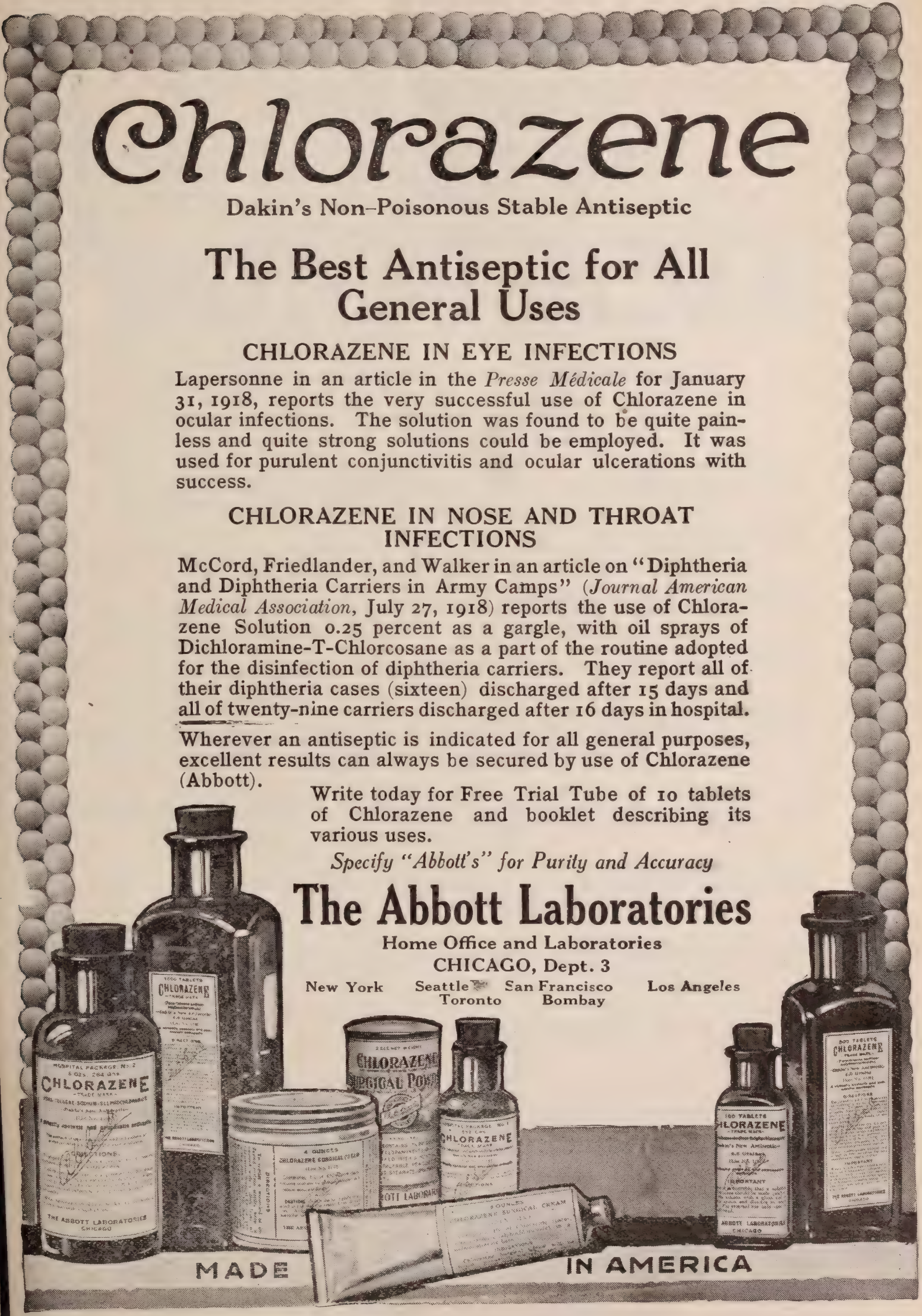

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OCTOBER, 1918 — Vol. VIII, No. 10

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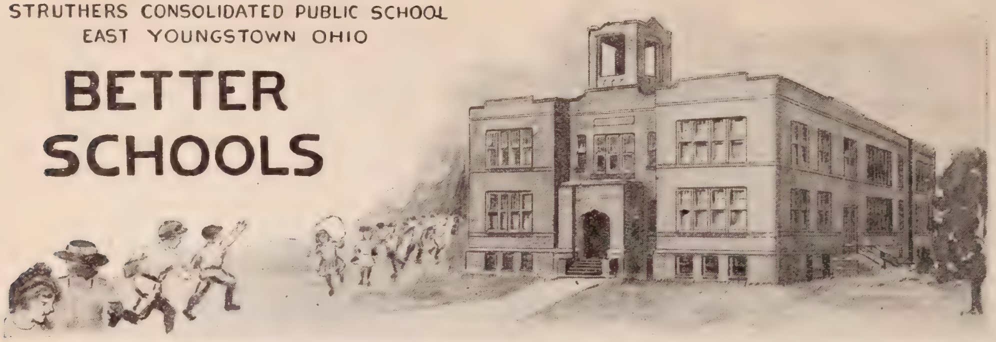

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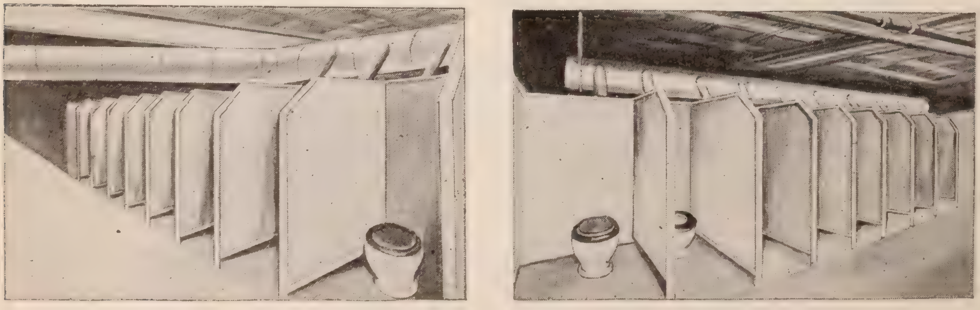

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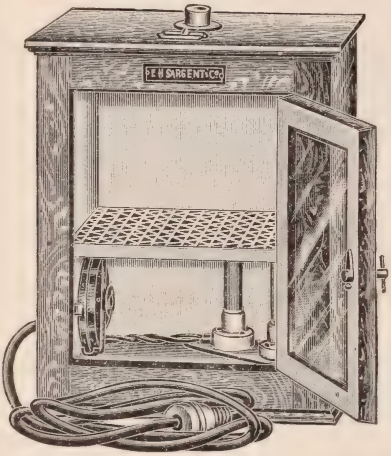

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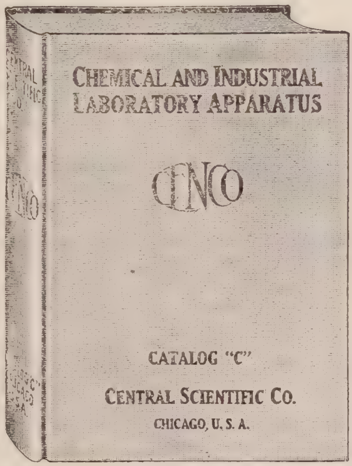

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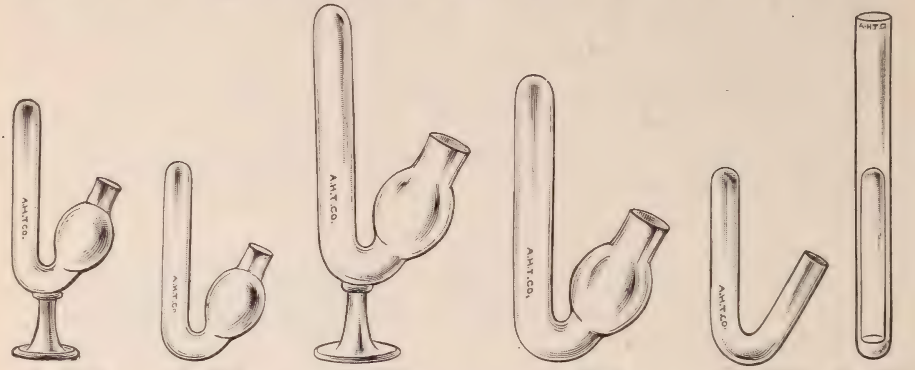
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⁂

The Smudge Cure.—"Nervous breakdown; debility; nothing much to worry about. Get in the country; long walks in the open air, etc. No alcohol in any form, and—"

The patient sighed.

The doctor packed away his tools.

"And one cigar a day!"

"Oh, doctor—not that!"

"One cigar a day!" reiterated the doctor, inexorably.

Six weeks later the patient returned to town.

"How do you feel?" queried the doctor.

"Splendid! Fit as a fiddle!"

"And you liked it all?"

"Yes, everything except the one cigar."

The doctor wagged his head and smiled.

"The tobacco habit, my dear sir—"

"Isn't any joke," put in the patient ruefully. "It is hard for a man at my time of life to take up smoking."—*Good Health.*

⁂

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—*Canadian Food Bureau.*

The Draft in the Range.—American people, says *Tit-Bits*, have a very high appreciation of the humor of Englishmen, and have been specially tickled by a story Colonel Cody used to tell. He said that some years ago an Englishman who had never been in the West before was his guest. They were riding through a Rocky Mountain cañon one day, when suddenly a tremendous gust of wind came swooping down upon them and actually carried the Englishman clean off the wagon-seat. After he had been picked up, he combed the sand and gravel out of his whiskers and said: "I say! I think you overdo ventilation in this country!"

⁂

Pure Food.—Into a general store of a town in Arkansas there recently came a darky, complaining that a ham that he had just purchased was not good.

"The ham is all right, Zeph," insisted the storekeeper.

"No, it ain't, boss," insisted the negro. "Dat ham's shore bad."

"How can it be," continued the storekeeper, when it was cured only a week?"

"The darky scratched his head reflectively, and finally suggested:

"Den, mebby it's had a relapse."—*Good Health.*

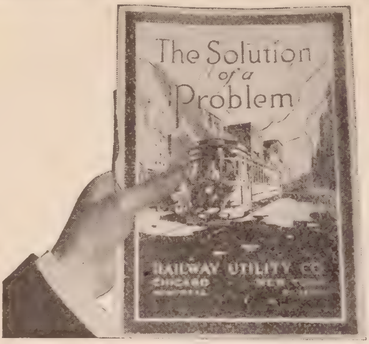
⁂

Watch Out!

The Board of Health's rules come
To our house to stay,
To report the ketchin' diseases,
Keep the neighbors' kids away.
For if you don't report 'em,
There ain't a bit of doubt,
That the Board of Health'll git you,
Ef
you
don't
watch
out!

⁂

The Virtues of War Bread.—There have been differences of opinion in America, as in this country, regarding the taste of war bread. The Health Commissioner for Chicago says in a recent issue of his *Bulletin* that "it is no use kicking at having to eat bread made of barley, oatmeal, and buckwheat, when really the new article of food is as palatable as the bread of former years, and if anything more nutritious." He suggests emulation of the opinion of the old lady who, having but two teeth remaining said, "But, thank God, they hit."—*The Lancet.*



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No Peace Talk for Him.—Willie was out walking with his mother, when she thought she saw a boy on the other side of the street making faces at her darling.

"Willie," asked mother, "is that horrid boy making faces at you?"

"He is," replied Willie, giving his coat a tug. "Now, mother, don't start any peace talk—you just hold my coat for about five minutes."—*Medical Fortnightly.*

*

Jealous.—"Ef mah wife don't stop lettin' dat galler niggah Smiff keep makin' eyes at huh, I'se gwin' lapse mah insurance."—**Exchange.**

*

Herbie Hoover.

Little Herbie Hoover's come to our house to stay,
To make us scrape the dishes clean, an' keep the crumbs away,
An' learn to make war bread, an' save up all the grease,
For the less we eat of butter, the sooner we'll have peace,
An' all us other children, when our scanty meal is done,
We gather up around the fire an' has the mostest fun
A-listenin' to the proteins that Herbie tells about,
An' the Calories that git you
Ef
you
don't
watch
out!

An' little Herbie Hoover says, when the fire burns low,
An' the vitamines are creepin' from the shadows, sof' and slow,
You better eat the things the Food Folks says they's plenty of,
An' cheat the garbage pail, an' give all butcher's meat the shove,
An' gobble up the corn pone an' vegetables an' fish,
An' save your drippin' an' yer sweets an' lick clean ever' dish,
An' don't get fresh a-talkin' of what you won't do without,
Or the Calories'll git you
Ef
you
don't
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out!

—Sophie Kerr, in *Life.*

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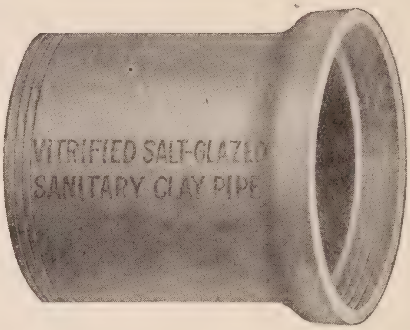

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*

Physical Education.—There has been no universal physical training for the children and youth of the country on a judicious program everywhere enforced. The American schools, both elementary and secondary, have neglected this important element in the training of the children; and the increasing urban population has had no opportunity of remedying this defect of the schools, through well-organized play and out-of-door sports or exercises. Children brought up in the country have of course had more chances than city children to compensate the defects of their schools as regards physical training. Looking on at ball games is not physical training and the real participants in such exercises are few.

To secure for every child in the country a complete course of physical training is a great national object in war times and peace times alike, and part of the expense of the course should be borne by the National Government.

The war with Germany has already taught us that the United States should henceforth and at once do the same thing in aid of the much larger expenditures of the States and the municipalities on the same all-important subject, and should make sure that the training is actually given. When a proper course of physical training has been in operation in the United States for twelve to fifteen years, the productiveness of the national industries will show a great increase, and the young men who are to fill the permanent Army and Navy of the United States will come to the annual mobilization with bodies already fit for the work of a soldier or sailor.—*Charles W. Eliot.*

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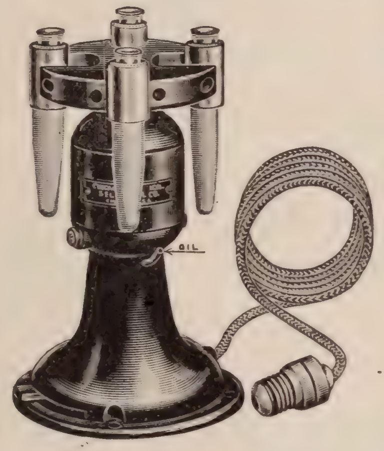

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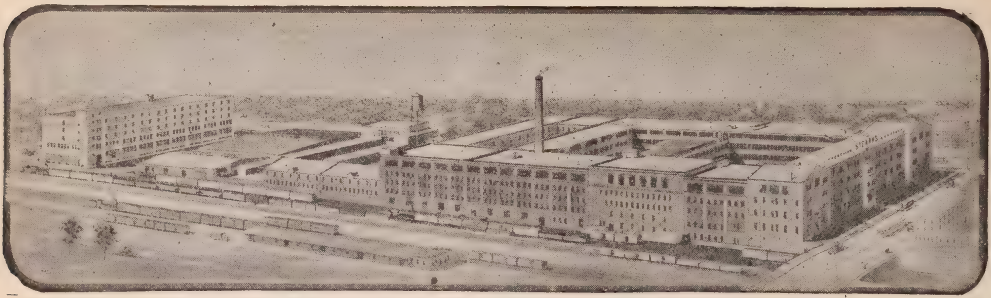

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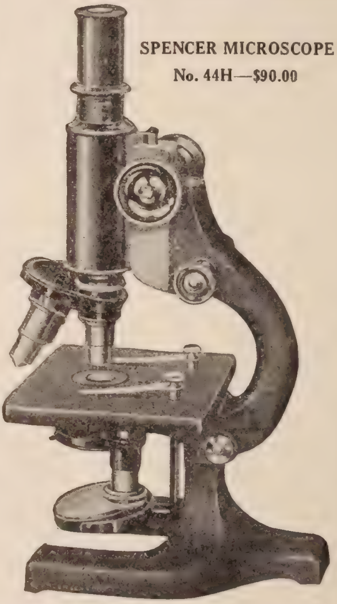

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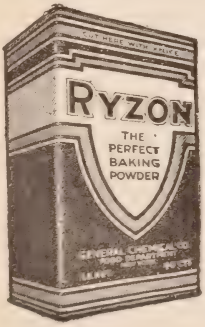

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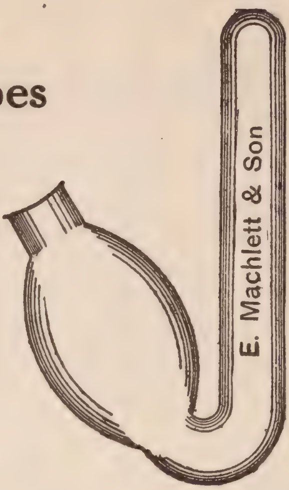

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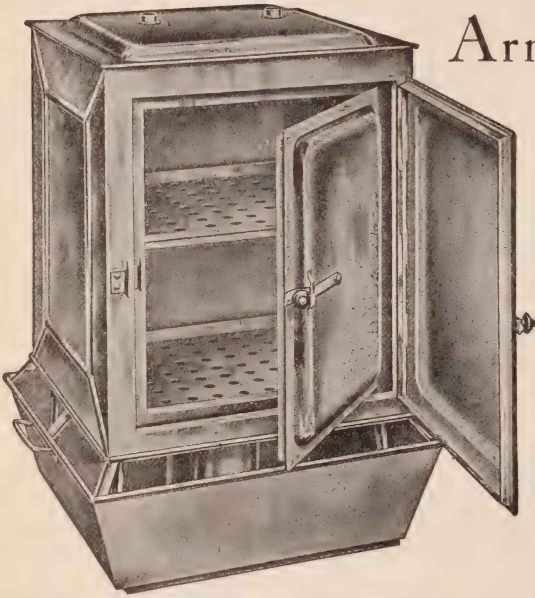

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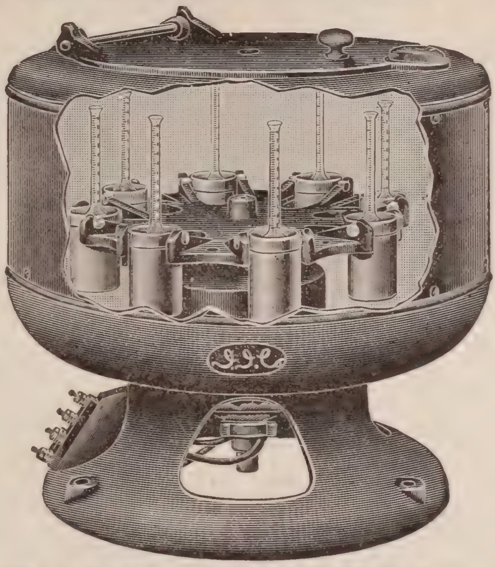

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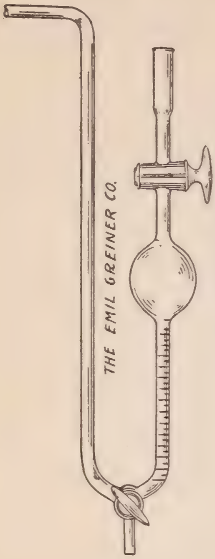

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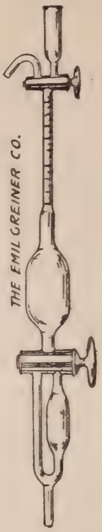

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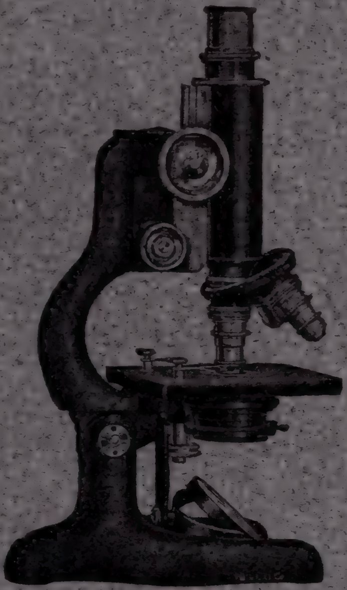

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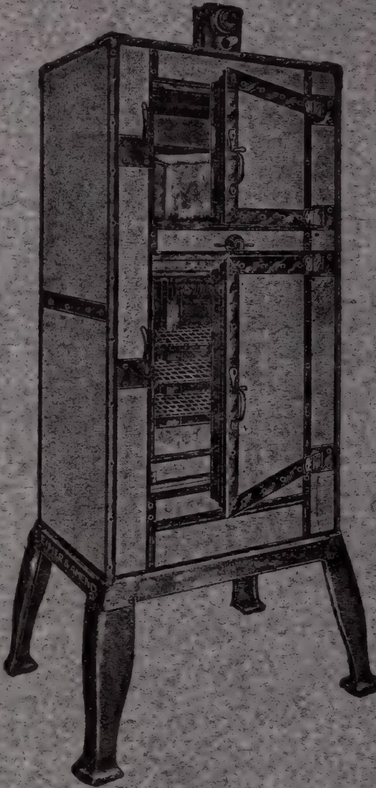

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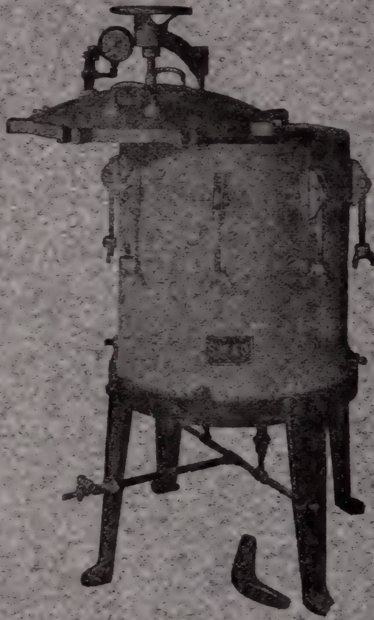

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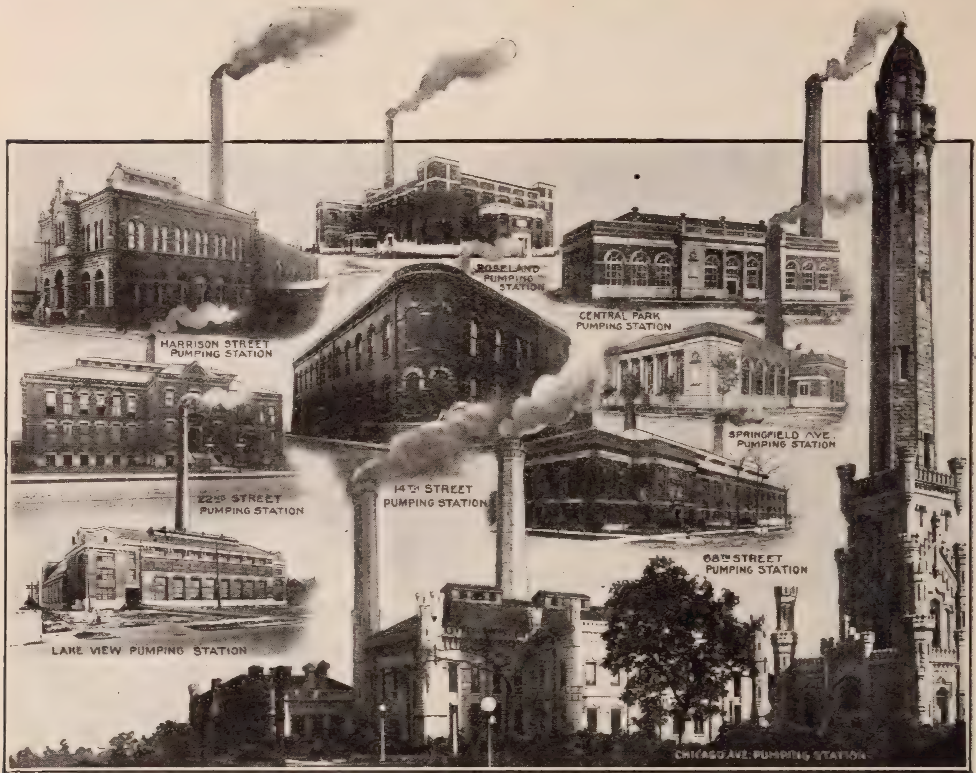
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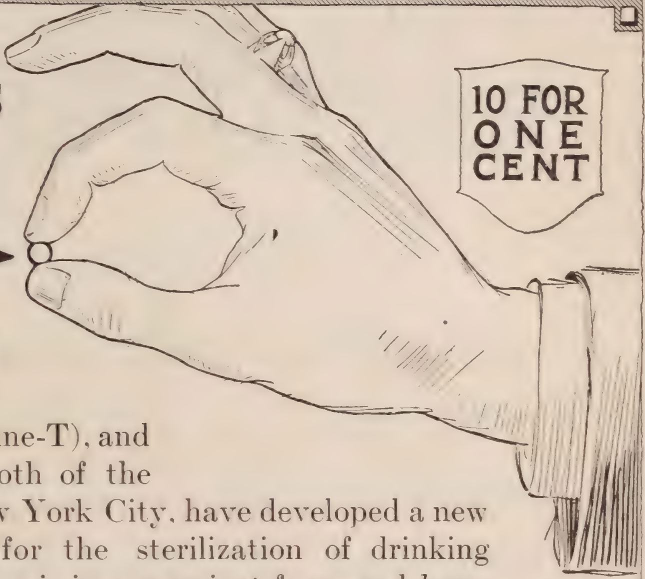

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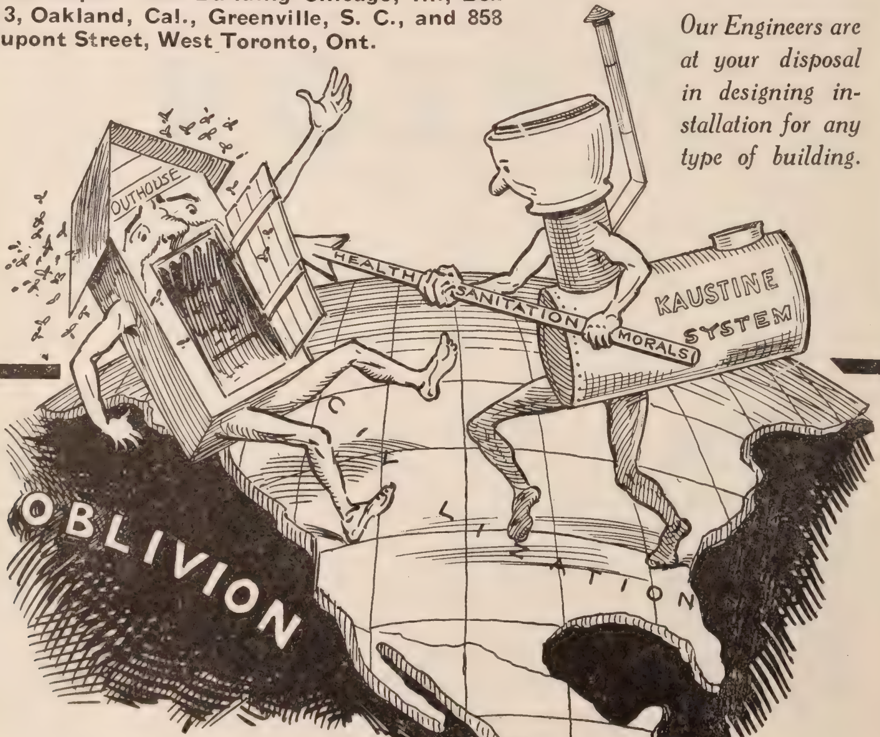

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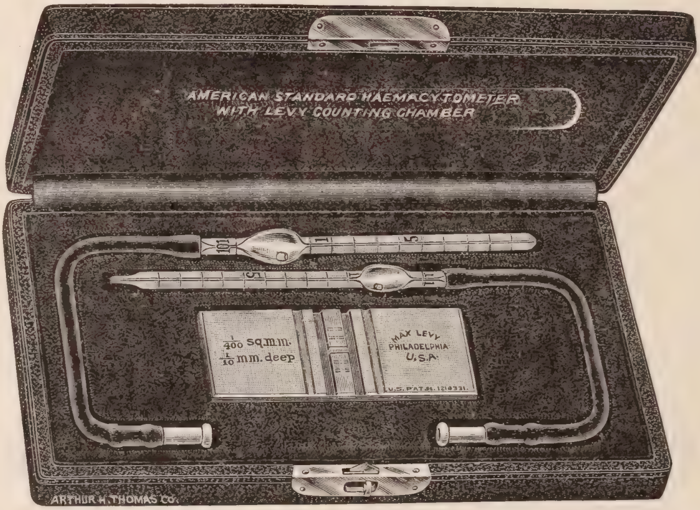

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Public Health Laboratory Notes—*Continued*

Passage of Rabies through Placenta to Fetus.—A gravid bitch succumbed to rabies at term. Rabbits inoculated with medulla tissue from the mother and from the fetuses all died with symptoms of rabies.—Lafranchi and Lenzi, *Annali d'Igiene (Rome)*, 28,233 (1918); *Jour. Am. Med. Assoc.* 71, 1096 (1918).

*

The Isolation of Dysentery Bacilli from the Feces.—It is absolutely necessary to employ fresh specimens. Selected portions are spread on surface of a MacConkey plate in a manner indicated in a diagram. The plate is incubated 18 to 24 hours at 37° C. Likely colonies are picked off and identified by reaction upon sugars, indol, litmus milk and by agglutination with specific sera. The authors isolated only two B. dysenteriæ Flexner out of some 5,000 examinations of stools which contained neither pus nor mucus; and never a B. dysenteriæ Shiga. This shows the futility of examining stools of this character.—Henry Whitehead and J. Kirkpatrick, *Lancet (London)*, 195, 143 (1918).

*

Prophylactic Antipneumococcic Vaccination.—Prophylactic injections of pneumococci types I, II, and III were employed. A preliminary investigation was made by inoculating 42 volunteers. On the basis of the preliminary investigation a vaccine, with a total dosage of 6 to 9 billion pneumococci of each types I, II, and III, was injected hypodermically in four small instalments at weekly intervals into 12,579 soldiers. A control set of 19,481 non-inoculated soldiers developed during the period of observation 26 cases of pneumonia, whereas the test-set showed but one case (recovery). It appears that the vaccine protects against the three types of the organism, but it remains to be seen how long the immunity will last. The constitutional reaction to the vaccine is not severe. The local reaction resembled that seen after antityphoid inocculation.—R. L. Cecil and J. H. Austin, *Jour. Exp. Med.*, 28, 19 (1918).

*

The Production of Acid by Pneumococci.—Actively growing pneumococci produce acid at such a rate that the change in the p^H of the medium parallels the change in the rate of growth. The death of pneumococci is not followed by a change in reaction. Growth in beef infusion media stops when p^H reaches 7. The increase in hydrogen on concentration of the medium is not the sole cause of cessation of growth.—G. E. Cullen and A. M. Chesney, *Jour. Exp. Med.*, 28, 289 (1918).

(*Continued on page XIX*)

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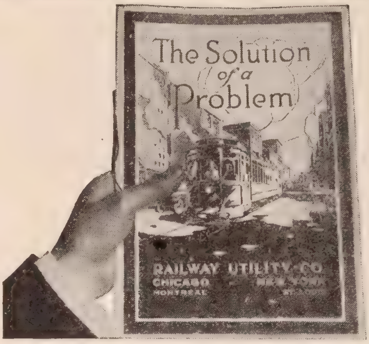

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PUBLIC HEALTH LABORATORY NOTES—*Continued*

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⁂

A New Dye-Medium for the Isolation of the Typhoid-Dysentery Group from Feces.—By the addition of 0.25 per cent of metachrome yellow II R. D., an anilin product, to nutrient agar, the writer finds that the growth of the cocci and sporing bacilli present in the feces is inhibited, while the dye has not any restraining influence on bacilli of the typhoid-dysentery group.—G. Gassner, *Centr. bl. Bakt. Orig.* 81, 117 (1917); *Rev. Bact.* 8, 36 (1918).

⁂

A Method for Staining Malarial Parasites in Blood.—Blood films, having been prepared in the usual way, are stained as follows: The film is fixed by immersion in methyl alcohol for from 1 to 5 minutes. The films are then stained for from 15 to 20 minutes in the following solution:

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⁂

A New Method for Spore Staining.— Dissolve 4 grams of brilliant green and 2 grams of acid fuchsin in a mixture of 50 cc. of chemically pure acetic acid with 50 cc. distilled water. Cover the film and heat to steaming point three or four times. The film is washed in distilled water until the color becomes distinctly green. On examination bacilli are found to be stained green while their spores are of a red color.—C. Botelho, *Compt. rend. de la Soc. de Biol.* 81, 183 (1918); *Rev. Bact.*, 8, 53 (1918).

(*Continued on page XXI*)

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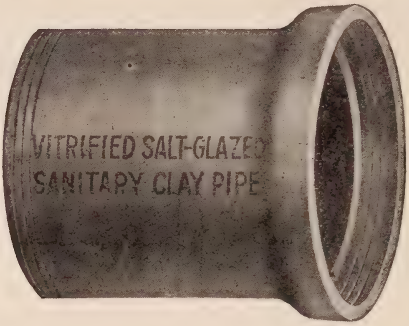

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Public Health Laboratory Notes—*Continued*

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✱

Isolation of Dysentery Bacilli from Feces.—Exceedingly good results have been obtained by using the following method:

(a) With sterilized platinum loop pick from fresh specimens of feces a small portion consisting of pus and mucus.

(b) Wash it well in sterilized normal saline and remove it immediately with loop, allowing excess saline to drain away along sides of tube.

(c) Rub and spread washed pus and mucus well on to surface of MacConkey plate at one spot.

(d) Sterilize loop and make vertical stroke from the site of the first inoculation.

(e) Again sterilize and make a series of horizontal strokes across vertical one without removing loop.

(f) Incubate 18 to 24 hours at 37° C.

By this method the portion of specimen most likely to contain B. dysenteriæ is selected. The washing helps to remove various coliform organisms, etc., not wanted. The rubbing and spreading of pus and mucus tends to break up pus cells, liberating bacilli sought for. The stroke method with two sterilizations of loop gives three dilutions, a good separation of colonies on the plate, and does away with necessity of using two or more plates for the same case, sometimes recommended.

It is recommended that the MacConkey's medium used be made up with *double the strength of neutral red*—*i. e.* 0.5 cc. of a 1 per cent solution to every 100 cc. of agar.—Whitehead, H. and Kirkpatrick, J., *Lancet.*, August 3, 1918, p. 143.

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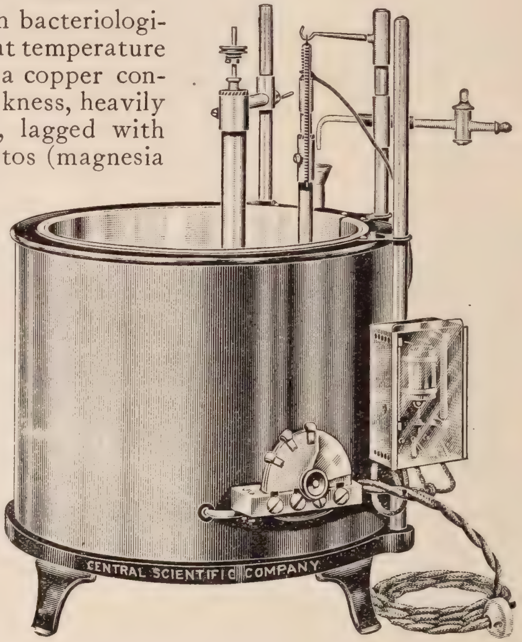

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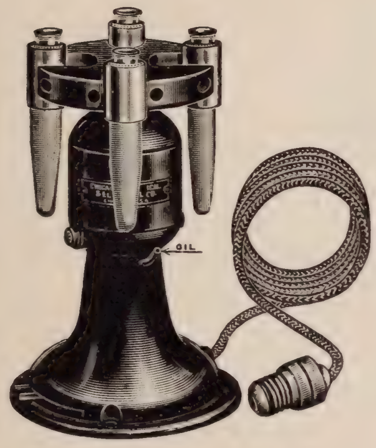

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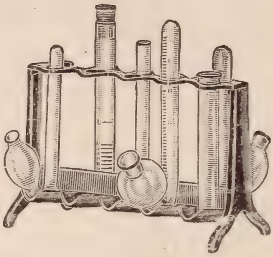

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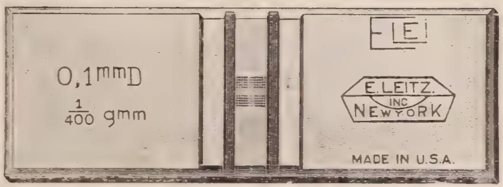

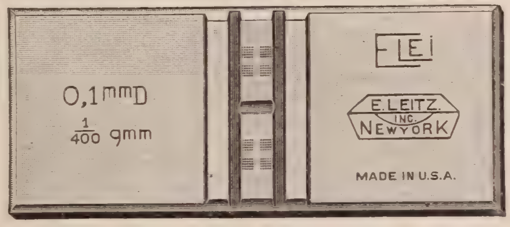

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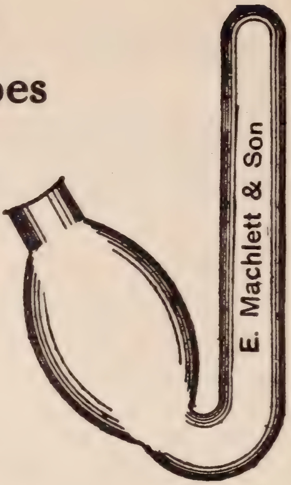

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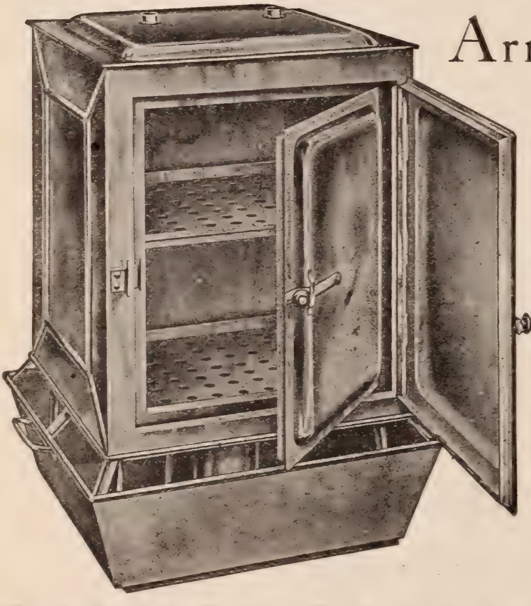

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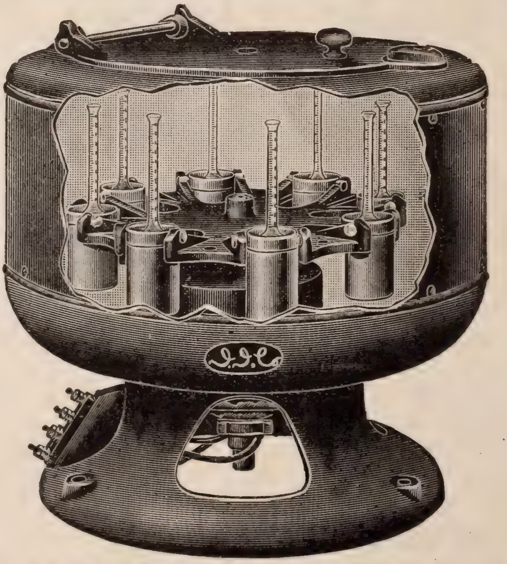

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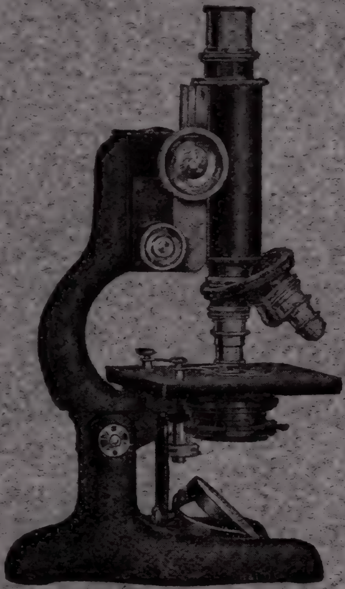

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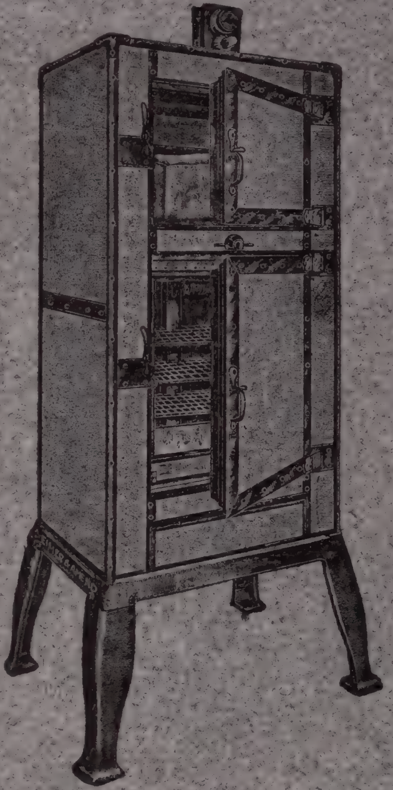

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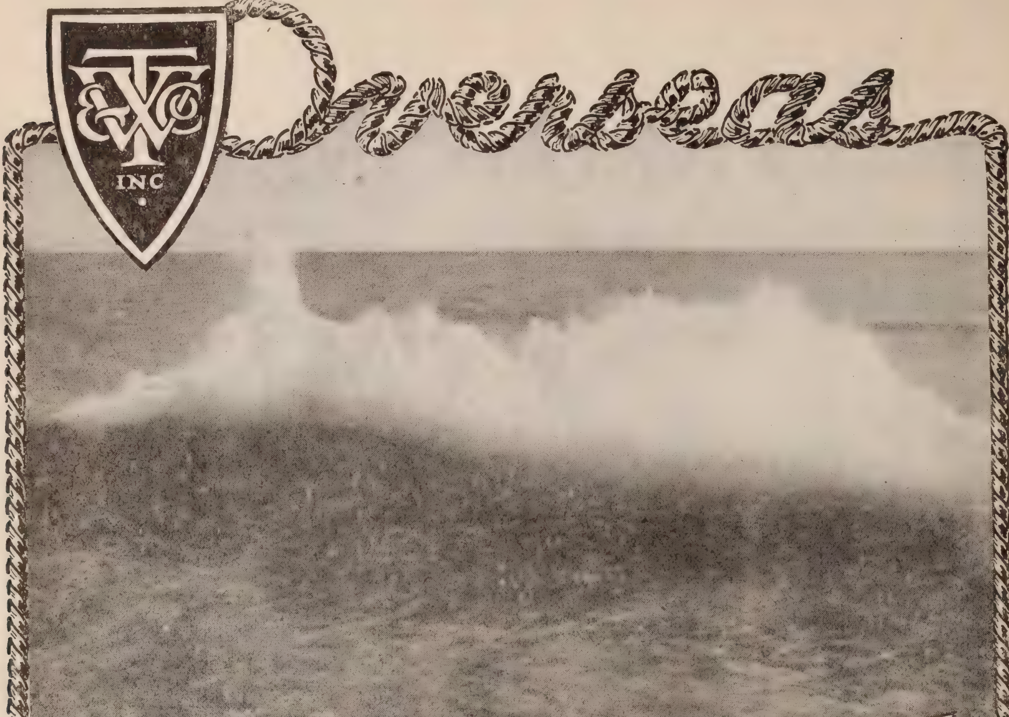

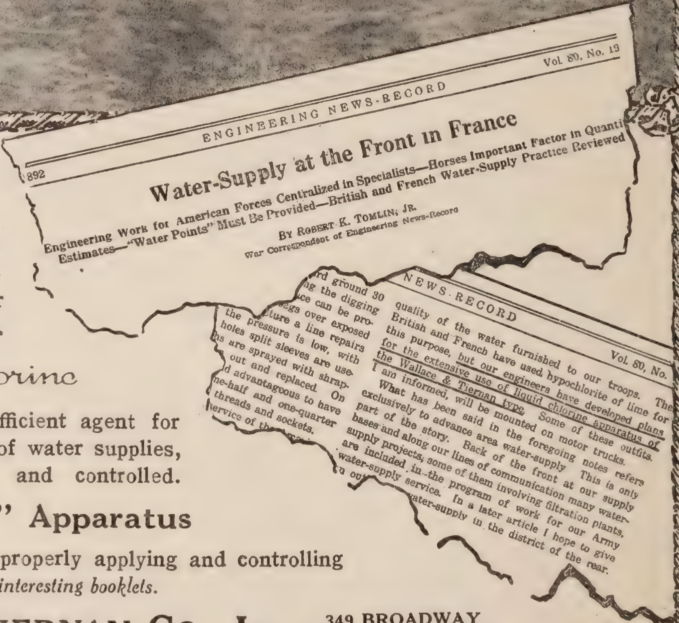

ENGINEERING NEWS-RECORD

892 Vol. 80, No. 19

Water-Supply at the Front in France

Engineering Work for American Forces Centralized in Specialists—Horses Important Factor in Quanti
Estimates—"Water Points" Must Be Provided—British and French Water-Supply Practice Reviewed

BY ROBERT K. TOMLIN, JR.
War Correspondent of Engineering News-Record

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threads and sockets.
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NEWS-RECORD Vol. 80, No.

quality of the water furnished to our troops. The British and French have used hypochlorite of lime for this purpose, but our engineers have developed plans for the extensive use of liquid chlorine apparatus of the Wallace & Tiernan type. Some of these outfits, I am informed, will be mounted on motor trucks.

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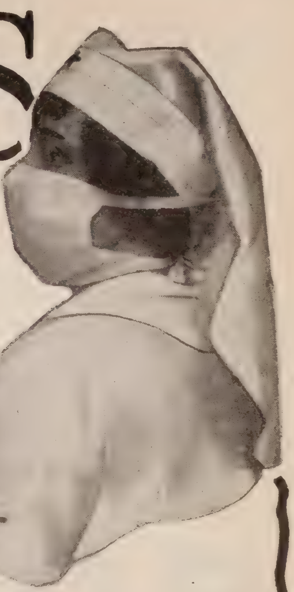

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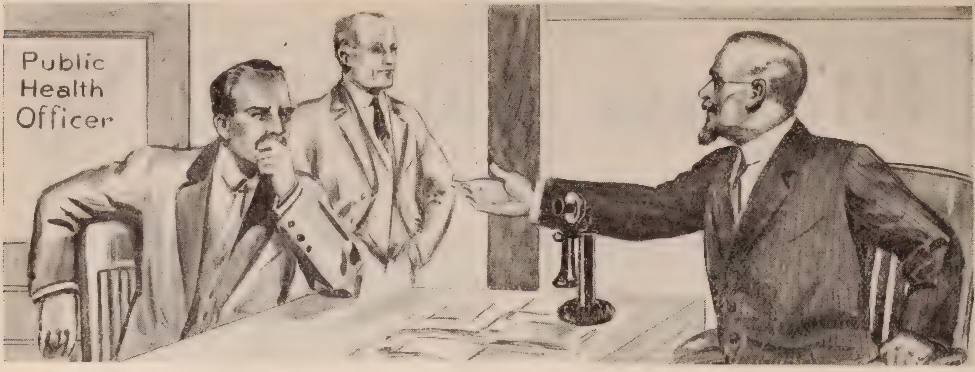

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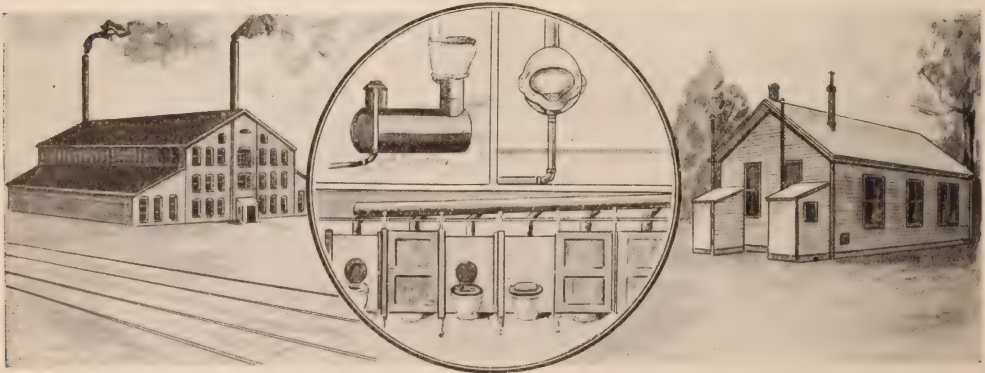

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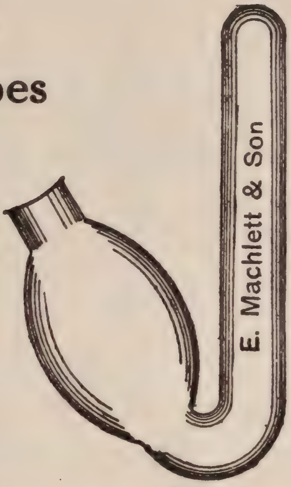

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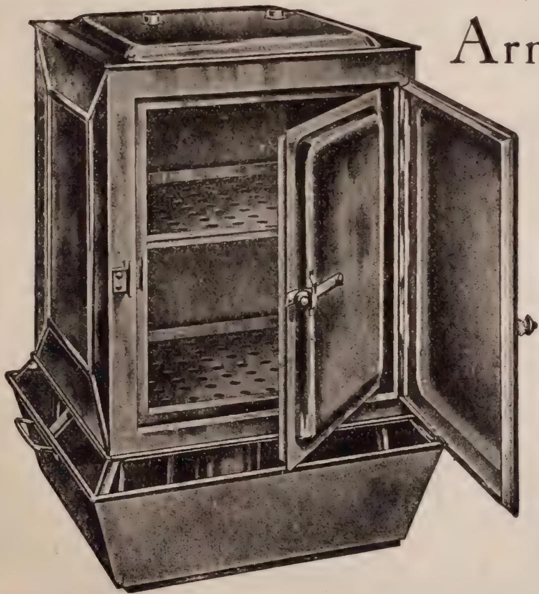

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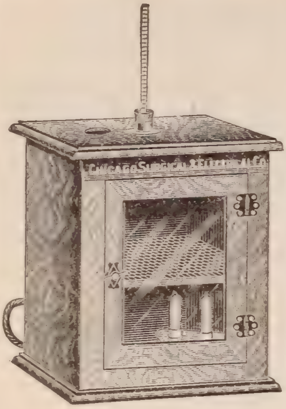

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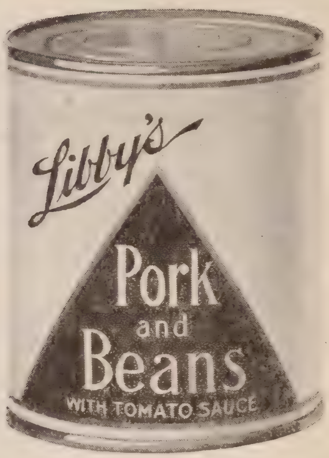

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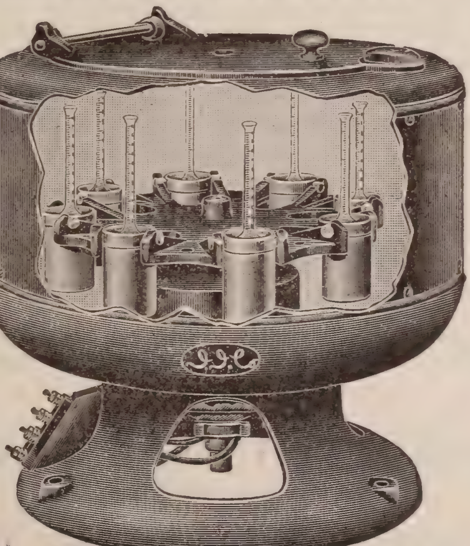

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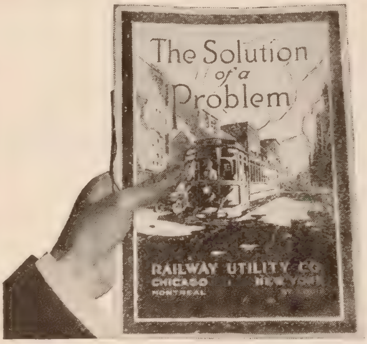

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will find in this booklet much of value to aid them in solving car ventilating and heating problems.

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Public Health Clippings

The Public Health Movement may be broadly defined as a social effort to prevent disease, to lengthen the life and usefulness of every member of society, and to afford opportunities for a normal physical and mental development of society.—*Rapeer.*

✣

Preparedness.—With a delightfully funny "Metropolitan Movies" cartoon the *New York World* presents this timely street conference:

Johnny—"Did ya get that fer yer birthday? Gee! that's some hankachif."

Jimmy—"Yeh, me mother made it fer me. It's good fer a hundred sneezes."

✣

Health and Patriotism.—If your community is not 100 per cent patriotic in its protection of the public health who is to blame? Are you doing your share?—*Florida Health Notes.*

✣

Epigrams from New Mexico.

A deal of health progress is blocked because some men have their wishbones where their backbones ought to be.

A push is better than a knock any time. You know yourself the old-fashioned knocker has been replaced by the electric push button.

We do not share the prejudices of the man that opposes the "rest cure" on the ground that more people die in bed than anywhere else.—*Herald of the Well Country.*

✣

Grip or "Flu."

There was a man in our town,
  And he was wondrous wise.
When Spanish "flu" first came along,
  It took him by surprise.
But when he knew he had the "flu,"
  With all his might and main,
Did what his doctor made him do,
  And soon was well again.

Another man in our town
  Was not so wondrous wise.
He, too, fell victim to the "flu,"
  As you might realize.
He followed faithfully each cure
  Suggested by each friend.
A dozen methods brought him to
  A most untimely end.

—*Sandoval Sal.*

(*Continued on page XXI*)

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Sniff, and the world suspects you,
Sneeze, and you sit alone.
—*Exchange.*

*

Healthgrams.

Health bookkeeping leads to the adoption of health measures.

It also shows that negligence in health is extremely costly.

If life insurance is good, why not health insurance?

Self-preservation is more than an instinct.

Food is the fuel by which the fires of life are kept alive.

Bacterial activity may convert some foods into poison.

Such poison may be formed without affecting the taste or smell, as in milk.

Mouth, nose and teeth are the doorways of disease.

Bar disease by protecting the door.

Heavy eating will shorten life and prolong the war.

The "clean plate" will help win the war.

*

The "Flu" and You!

As along the street you trip
Do not spit! You'll spread the grippe.
Here's some good advice for you,
Do not cough! You'll spread the "flu."
Do not sneeze! You base deceiver,
Or you'll spread catarrhal fever.
Listen now to my cadenza,
Watch out for the influenza.
—*Bernalillo Leo.*

*

Safe!

The Squire—I sent word, Giles, that the drinking-water isn't very pure just now. I hope you are taking precautions.

Giles—Yes, zur—Oh, yes, zur; the old wumman, she biles it, and then she filters it, as you said we must—

The Squire—Excellent!

Giles—Yes, zur—and then we drinks beer!—*Passing Show* (*London*).

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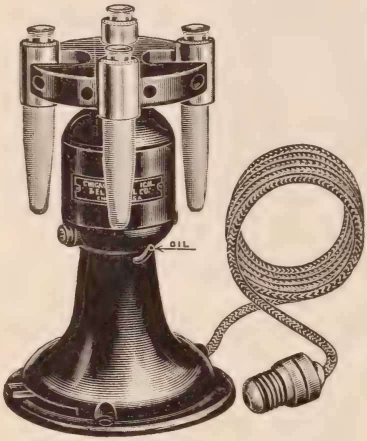

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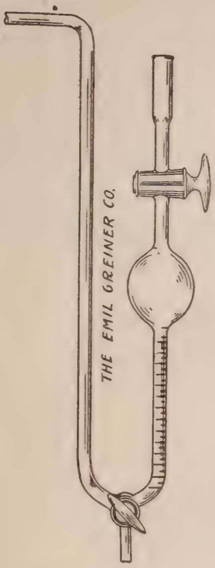

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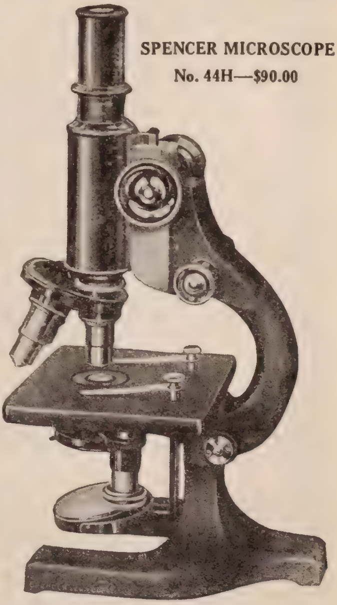
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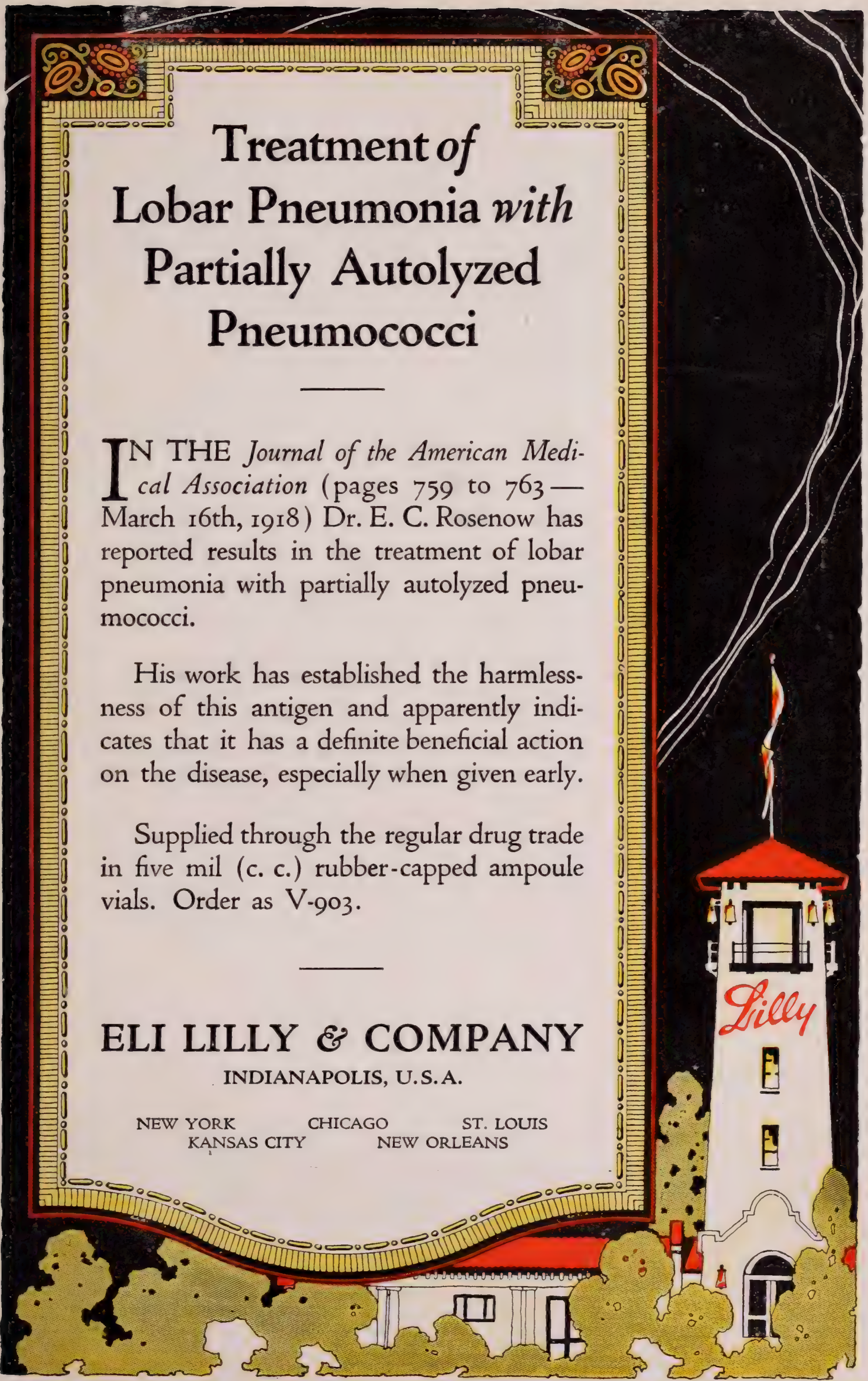

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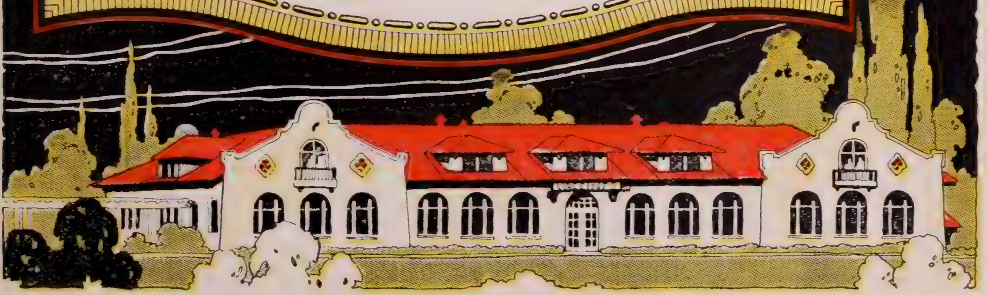

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THERE is no cure for rabies, once the symptoms have developed, but the disease may be prevented, during the incubation period, in persons bitten by rabid animals, by prophylactic injections of attenuated rabies virus.

WHAT THE VIRUS IS. The brains and spinal cords of animals dead from fixed virus inoculation are ground to a paste, frozen, pulverized and rapidly dried in vacuo. The powder is tubed in vacuo and stored in the cold.

ADVANTAGES OF RABIES VIRUS, LILLY

1. A high degree of immunity is established in a short time.
2. The virus is practically non-toxic (treatment free from complications, lessened reactions.)
3. The virus is uniformly distributed through the vaccine.
4. The patient's time and money are economized.
5. It is available for prompt institution of treatment at home by the family physician.
6. The dosage is standardized in units according to the Harris Method (the early doses increasing to a maximum unitage, and this maximum unitage repeated to the end of treatment).

HOW RABIES VIRUS, LILLY, IS SUPPLIED

Lilly's Rabies Virus is supplied in syringe containers, emulsified and ready for use. Your druggist can secure the first three doses from the nearest Lilly depot; the remaining eleven doses will be supplied from Indianapolis, one daily, until the complete treatment of fourteen doses has been administered.

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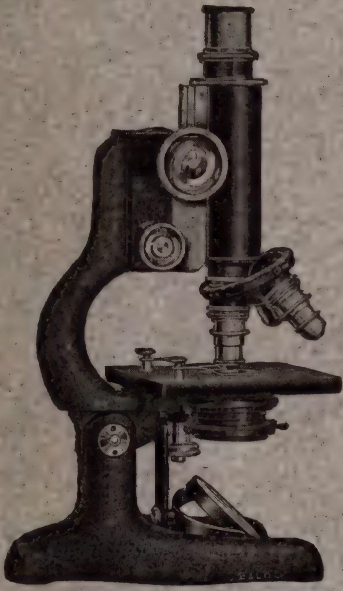

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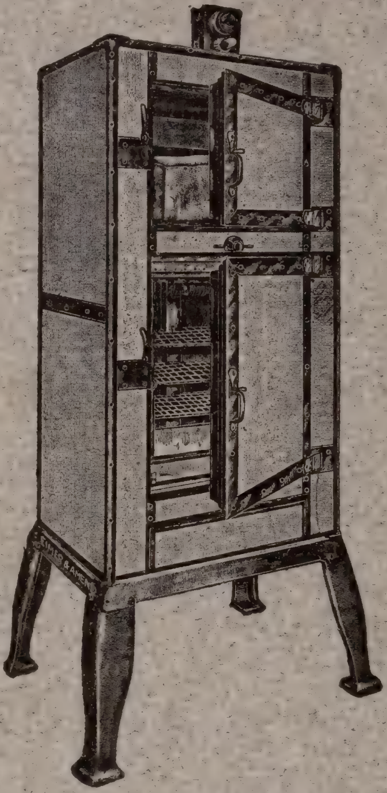

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